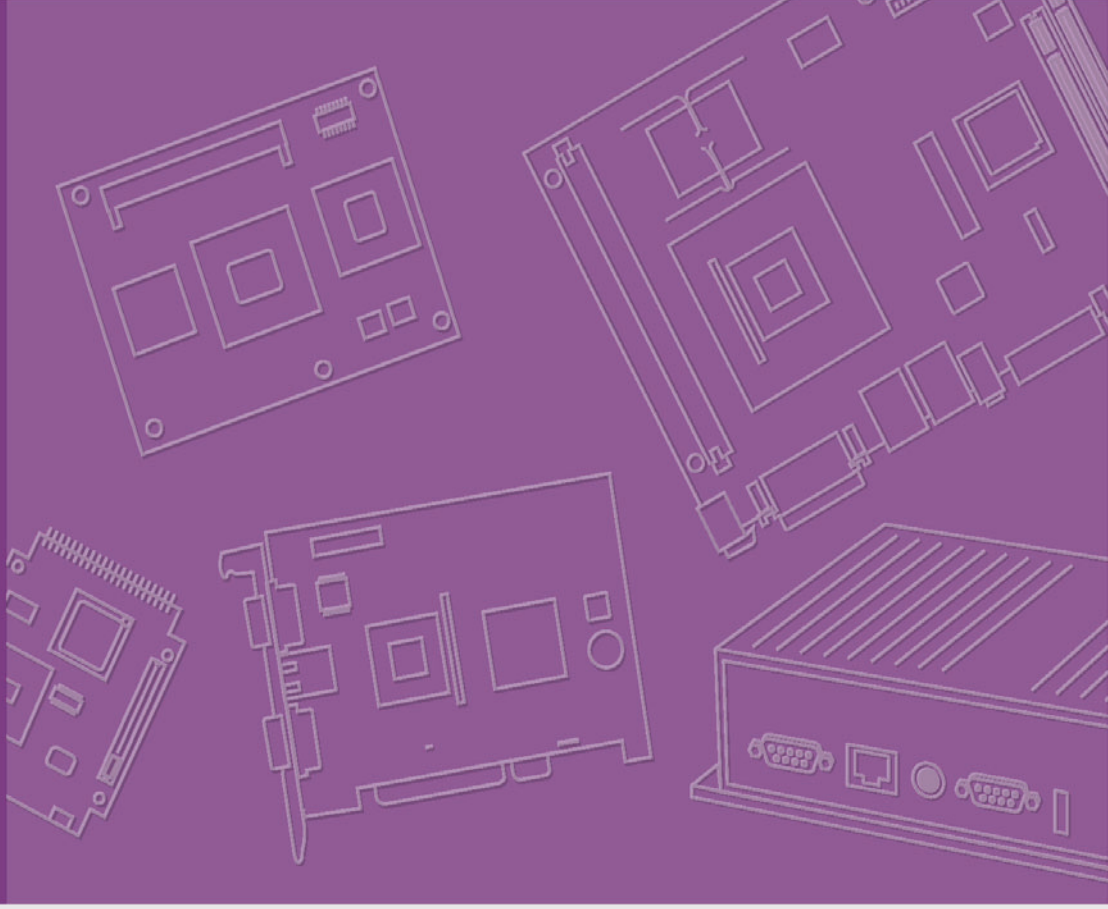

User Manual

PCA-6010

PICMG 1.0 Full-sized Intel® LGA775 processor Card with VGA / Single Gigabit LAN

Trusted ePlatform Services

ADVANTECH

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A Message to the Customer

Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Memory Compatibility

Brand	Size	Speed	Type	Memory
Apacer(RoHS)	512MB	DDR2 533	DDR2	ELPIDA E5108AG-5C-E (64x8)
	512MB	DDR2 667	DDR2	ELPIDA E5108AG-6E-E (64x8)
	1GB	DDR2 533	DDR2	SAMSUNG K4T51083QB-ZKD5 (128x4)
	1GB	DDR2 533	DDR2	ELPIDA E5108AGBG-6E-E (64x8)
	1GB	DDR2 667	DDR2	ELPIDA E5108AGBG-6E-E (64x8)
	2GB	DDR2 667	DDR2	SEC K4T1G08400 (128x8)
DSL	512MB	DDR2 533	DDR2	infineon HYB18T512 800AF37 FSS43331 (64x8)
	1GB	DDR2 533	DDR2	ELPIDA E5108AE-5C-E (64x8)
	1GB	DDR2 667	DDR2	ELPIDA E5108AGBG-6E-E (64x8)
	2GB	DDR2 667	DDR2	ELPIDA E1108ACSE-6E-E(128x8)
Kingston(RoHS)	2GB	DDR2 667	DDR2	Micron 7KE12 D9HNL (128x8)
Transcend(RoHS)	256MB	DDR2 533	DDR2	infineon HYB18T512160AF3.7 3VV21710 (32x16)
	256MB	DDR2 533	DDR2	SAMSUNG 443 K4T56083QF-GCD5 (32x8)
	512MB	DDR2 533	DDR2	SEC K4T51083QC ZCD5 (64X8)
	512MB	DDR2 667	DDR2	SAMSUNG K4T51083QC ZCE6 (64x8)
	1GB	DDR2 667	DDR2	SEC K4T51083QE ZCE6 (64x8)
	1GB	DDR2 667	DDR2	SEC K4T51083QG HCE6 (64x8)
	2GB	DDR2 667	DDR2	SAMSUNG K4T1G084QD-ZCE6 (128x8)
	2GB	DDR2 667	DDR2	Micron 7HE12 D9HNL (128x8)
	2GB	DDR2 667	DDR2	SAMSUNG K4T1G084QA-ZCE6 (128x8)

Network Feature Comparison

LAN/Model	PCA-6010LV	PCA-6010VG
LAN1: Intel® 82574L	No	Yes

Processor Support

Intel Core™ 2 Duo Desktop Processor Intel® Pentium® Dual-Core Desktop Processor Intel Celeron® Processor 400	Long-term supported P/N: E7400, E6400, E4300, E2160, Celeron 440, Pentium 4 651/551, Celeron D 352/341
Intel Pentium D Processor Intel Pentium 4 Processor Intel Celeron D Processor	

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your single board computer, please make sure that the following materials have been shipped:

■ PCA-6010 Intel® LGA775 processor-based single board computer	
■ 1 PCA-6010 startup manual	
■ 1 CD with driver utility and manual (in PDF format)	
■ 1 FDD cable	P/N: 1700340640
■ 1 Ultra ATA 66/100 IDE cable	P/N: 1701400452
■ 2 Serial ATA HDD data cable	P/N: 1700003194
■ 2 Serial ATA HDD power cable	P/N: 1703150102
■ 1 Printer (parallel) port & COM port cable kit	P/N: 1701260305
■ 1 Y cable for PS/2 keyboard and PS/2 mouse	P/N: 1700060202
■ 1 USB cable with 4 ports	P/N: 1700008461
■ 1 ATX 12 V power converter cable	P/N: 170304015K
■ 1 Jumper pack	P/N: 9689000068
■ 1 User Note for Full-Size CPU card	P/N: 2002721020
■ 1 User Note for LGA775 CPU	
■ 1 warranty card	

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the PCA-6010 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the PCA-6010, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Note! *PCA-6010 must use a proprietary CPU cooler, we strongly recommend purchase it from Advantech (p/n: 1750000332).*

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Chapter 1

Hardware Configuration

1.1 Introduction

The PCA-6010 is designed with the Intel® 945GC and ICH7 chipset (I/O controller) to support Core™ 2 Duo, Dual-Core Pentium® D / Pentium® 4 / Celeron® D processors (refer to “Processor Support” on page v) with a 533/667/800/1066 MHz front side bus and DDR2 533/667 MHz memory up to 4 GB. It follows the PICMG 1.0 specification and is the best solution for high-performance computing and applications in which a wide I/O bandwidth is demanded.

The PCA-6010 offers a high-performance cost-saving integrated graphics unit, built into the Intel® 945GC chipset, and features the unique Intel® Extreme Graphics architecture to maximize VGA performance and share system memory up to 224 MB. It has 2 DIMM sockets in two separated memory channels. It accepts up to 4 GB DDRII SDRAM memory, enough for most applications. The PCA-6010 has a single Gigabit Ethernet LAN via dedicated PCI Express x 1 bus, which offers bandwidths up to 500 MB/sec., eliminating network data flow bottlenecks, and incorporating Gigabit Ethernet to operate at 1000 Mbps. High reliability and outstanding performance make the PCA-6010 the ideal platform for industrial networking applications.

Four Serial ATA ports (up to 300 MB/s) allow the use of thin and long SATA cables for storage devices, eliminating cabling issues inside the industrial-grade chassis. In addition, the PCA-6010 also provides most of the popular I/O interfaces such as eight USB 2.0 ports, 2 RS-232 ports, one enhanced parallel port and a floppy disk interface.

The PCA-6010 is designed with considerations for extended reliability, and is built especially to suit demanding industrial environments. The CMOS data backup and restore function protects the BIOS setup data from loss due to battery failure.

The PCA-6010 also adopts Advantech's unique patented “AT Mode Control Circuit” for AT Power Mode. With all these excellent features and outstanding performance, the PCA-6010 is definitely the ideal platform for today's industrial applications.

1.2 Features

- Compliance with PICMG 1.0
- Supports LGA 775 Intel® Core™ 2 Duo / Pentium® Dual-Core / Pentium® D / Pentium® 4 / Celeron® 400 / Celeron® D FSB 533/667/800/1066 MHz processors (refer to “Processor Support” on page v)
- Supports Dual Channel DDR2 533/667 SDRAM up to 4 GB
- Single Gigabit Ethernet via PCI Express x1 port
- 4 SATA2 connector
- 8 USB 2.0 ports
- 2 COM port supports RS-232
- CMOS automatic backup and restore to prevent accidental data loss of BIOS setup

1.3 Specifications

1.3.1 System

- **CPU:** Intel® LGA 775 Core™ 2 Duo, Pentium Dual-Core, Pentium 4, Celeron D up to 2.93/2.7/3.4/3.6 GHz, (refer to “Processor Support” on page v), FSB 533/667/800/1066 MHz. PCA-6010 also has an optional CPU cooler (1750000332) for customers who use high-speed CPUs in 2U chassis or in a high-temperature environment.
- **L2 cache:** CPU has built-in 4 MB (for Core™ 2 Duo), 2 MB (for Pentium Dual-Core CPU), 2 MB (for Pentium 4 CPU), 512 KB (for Celeron D CPU) full-speed L2 cache
- **BIOS:** Award Flash BIOS (8 MB Flash Memory)
- **System chipset:** Intel 945GC with ICH7
- **SATA/EIDE hard disk drive interface:** Four on-board SATA2 connectors with data transmission rate up to 300 MB/s. One on-board IDE connector supporting up to two enhanced IDE devices. Supports PIO mode 4 (16.67MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/s data transfer rate.) BIOS enabled/disabled.
- **Floppy disk drive interface:** Supports two floppy disk drive, 5¼" (360 KB and 1.2 MB) or 3½" (720 KB, 1.44 MB). BIOS enable/disable.

1.3.2 Memory

- **RAM:** Up to 4 GB in two 240-pin DIMM sockets. Supports dual-channel DDRII 533/667 SDRAM.

1.3.3 Input/Output

- **PCI bus:** 32 bit / 33MHz to the backplane
- **Enhanced parallel port:** Configured to LPT1, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Two serial ports on-board. One pin header and one 9-pin D Sub connector located on the mounting bracket for easy connection
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on board keyboard pin header connector is also available
- **USB port:** Supports up to eight USB 2.0 ports with transmission rate up to 480 Mbps

1.3.4 Ethernet LAN

- Supporting single 10/100/1000Base-T Ethernet port(s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
- **Controller:**
  - LAN 1: Intel® 82574L

1.3.5 Industrial features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable to 255 levels, with each unit set to equal either one second or one minute.

1.3.6 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, depending on CPU) (operating humidity: 40° C @ 85% RH Non-Condensing)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F) non-condensing
- **Power supply voltage:** +5 V, +12 V, +5 VSBY
- **Power consumption:**
  - Configuration1: +5 V at 5.19 A, +12 V at 3.85 A, +5 VSBY at 0.06 A (Intel Core 2 Duo 1.8 GHz, 65 W, 800 MHz FSB + 2 x 2 GB DDR2 667)
  - Configuration2: +5 V at 4.85 A, +12 V at 12.45 A, +5 VSBY at 0.07 A (Intel Pentium 4 3.8 GHz, 115 W, 800 MHz FSB + 2 x 2 GB DDR2 667)
  - VSBY at 0.7 A (Intel Pentium 4 3.8 GHz (800 MHz FSB), 2 x 2 GB DDR2 800 SDRAM)
- **Board size:** 338 x 122 mm (13.3” x 4.8”)
- **Board weight:** 0.5 kg (1.1 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6010 single board computer link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure the system for any desired application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to the motherboard.

Table 1.1: Jumpers

Label	Function
CMOS1	CMOS Clear
JWDT1	Watchdog timer output selection

Table 1.2: Connectors

Label	Function
IDE1	IDE connector
FDD1	Floppy Drive connector
LPT1	Parallel port
VGA1	VGA connector
COM1	Serial port: COM1; RS-232 (9-pin D-Sub)
COM2	Serial port: COM2; RS-232 (9-pin Box Header)
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard/mouse connector
JIR1	Infrared connector
CPUFAN1	CPU FAN connector
JFP1	Power and Reset Button connector
JFP2	HDD LED/Speaker connector
JFP3	Power LED and keyboard lock connector
JOBS1	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
LAN1	LAN RJ45 connector
HDAUD1	HD Audio connector
SATA1	Serial ATA1
SATA2	Serial ATA2
SATA3	Serial ATA3
SATA4	Serial ATA4
LANLED1	LAN LED connector
USB12	Two USB port pin headers
USB34	Two USB port pin headers
USB56	Two USB port pin headers
USB78	Two USB port pin headers
DIMMA1	Memory connector channel A
DIMMB1	Memory connector channel B
LPC1	Low pin count connector
SPI1	BIOS SPI Sokcet
JCASE1	Case open

1.5 Board Layout: Jumper and Connector Locations

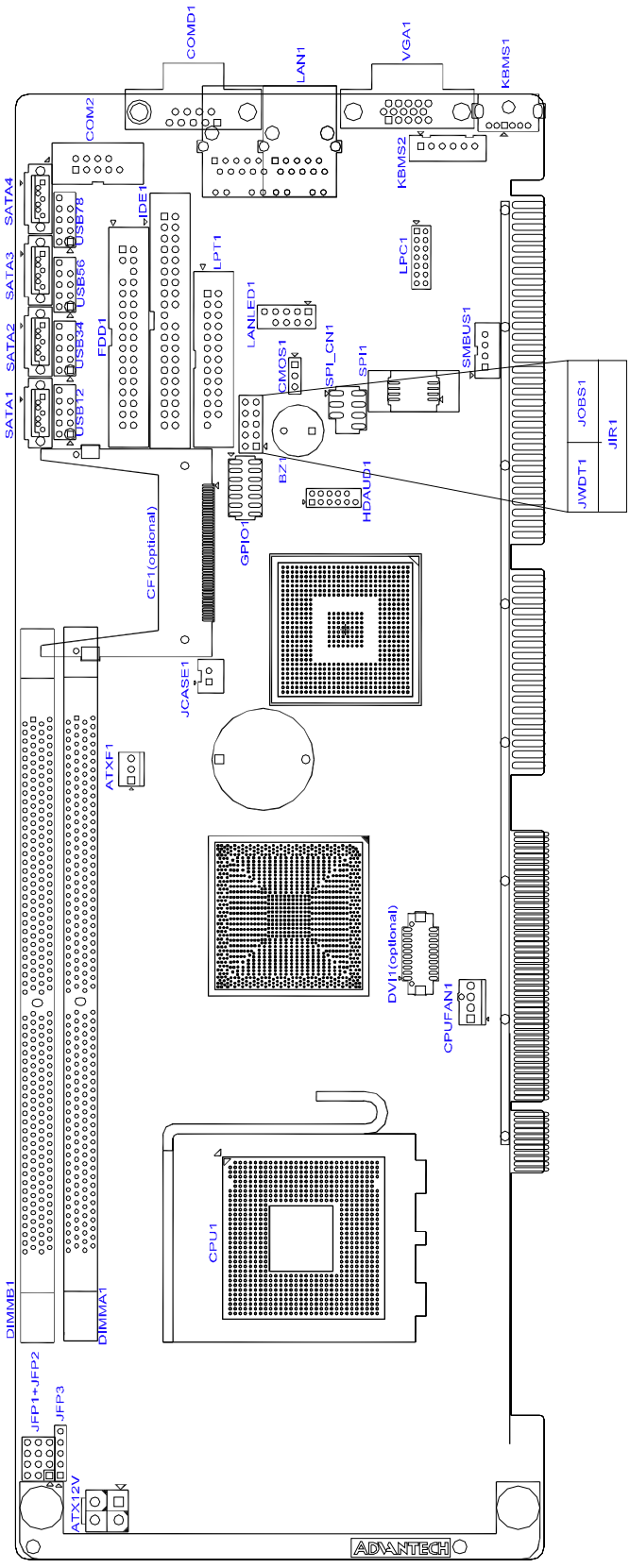


Figure 1.1 Jumper and Connector locations

1.6 PCA-6010 Block Diagram

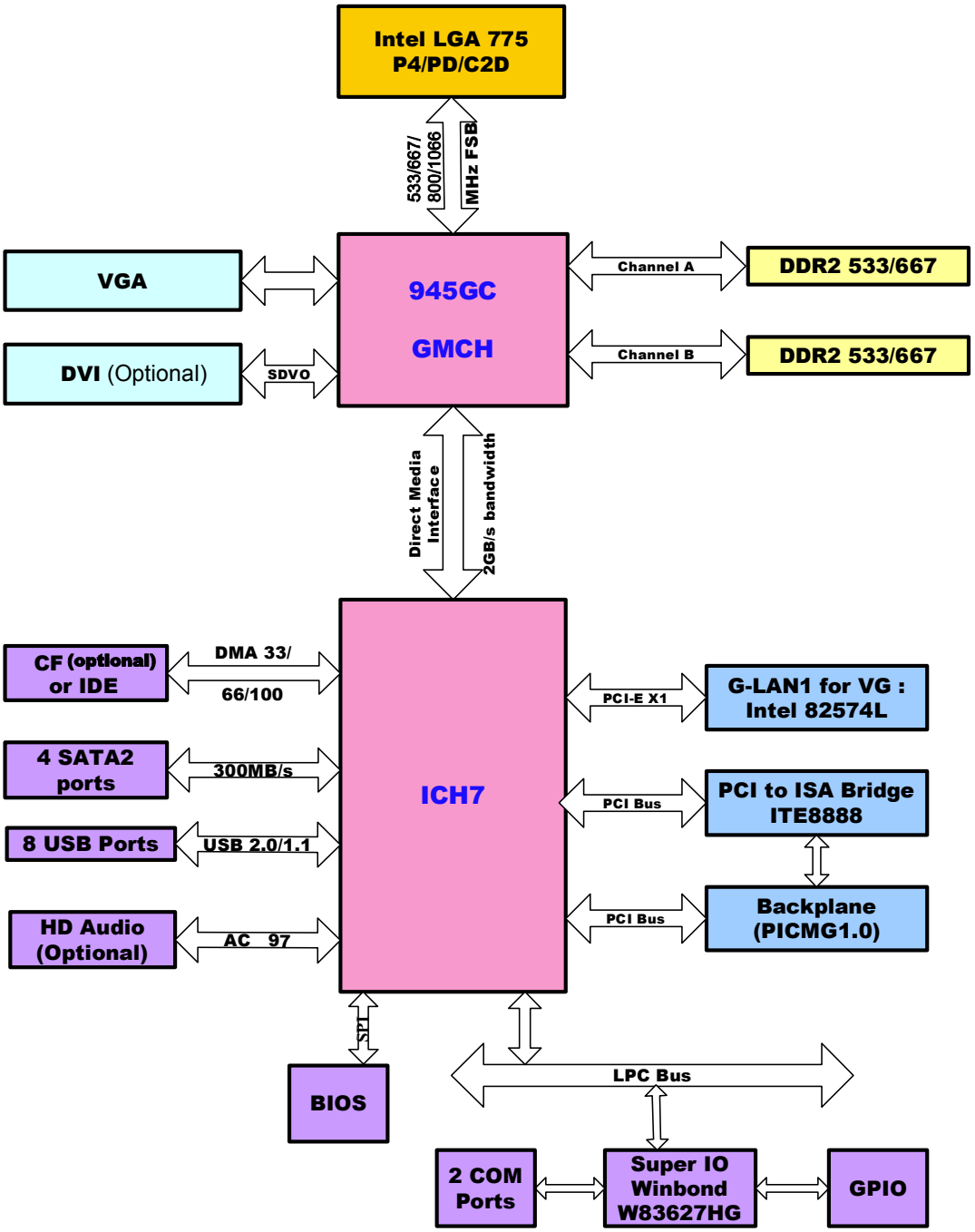


Figure 1.2 PCA-6010 Block Diagram

1.7 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the boards. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

Caution!

The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.

Caution!

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

1.8 Jumper Settings

This section provides instructions on how to configure your PCA-6010 by setting the jumpers. It also includes the PCA-6010's default settings and your options for each jumper.

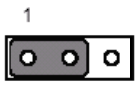
1.8.1 How to set jumpers

You can configure your PCA-6010 to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS clear (CMOS1)

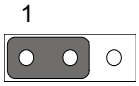
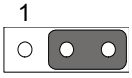
The PCA-6010 single board computer contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

.

Table 1.3: CMOS (CMOS1)	
Function	**Jumper Setting**
* Keep CMOS data	 1-2 closed
Clear CMOS data	2-3 closed
* default setting	

1.8.3 Watchdog timer output (JWDT1)

The PCA-6010 contains a watchdog timer that will reset the CPU in the event the CPU stops processing. This feature means the PCA-6010 will recover from a software failure or an EMI problem. The JWDT1 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.4: Watchdog timer output (JWDT1)	
Function	**Jumper Setting**
IRQ11	 1-2 closed
* Reset	 2-3 closed
*default setting	

1.9 System Memory

The PCA-6010 has two sockets for 240-pin dual inline memory modules (DIMMs) in two memory channels.

All these sockets use 1.8 V unbuffered double data rate synchronous DRAMs (DDRII SDRAM). They are available in capacities of 256, 512, 1024 and 2048 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 256 MB and 4 GB.

1.9.1 CPU FSB and memory speed

The PCA-6010 can accept DDR2 SDRAM memory chips without parity. Also note: The PCA-6010 accepts DDR2 533/667MHz SDRAM. The PCA-6010 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the “open” position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

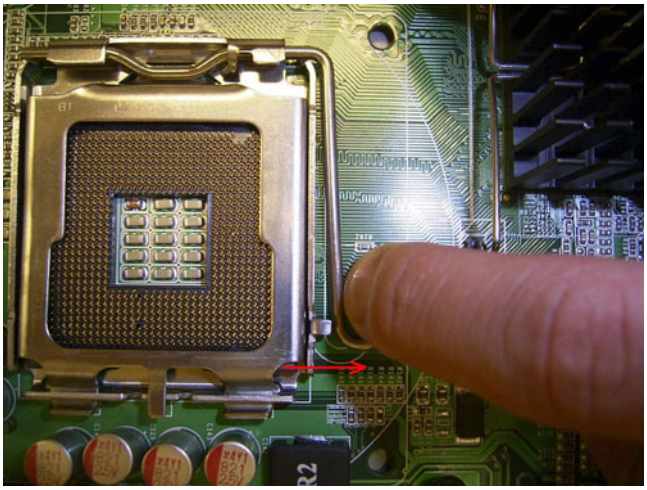
1.11 Cache Memory

The CPU that PCA-6010 supports built-in 4 MB (for Core™ 2 Duo), 2 MB (for Pentium Dual-Core CPU), 2 MB (for Pentium 4 CPU), 512 KB (for Celeron D CPU) full-speed L2 cache. The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

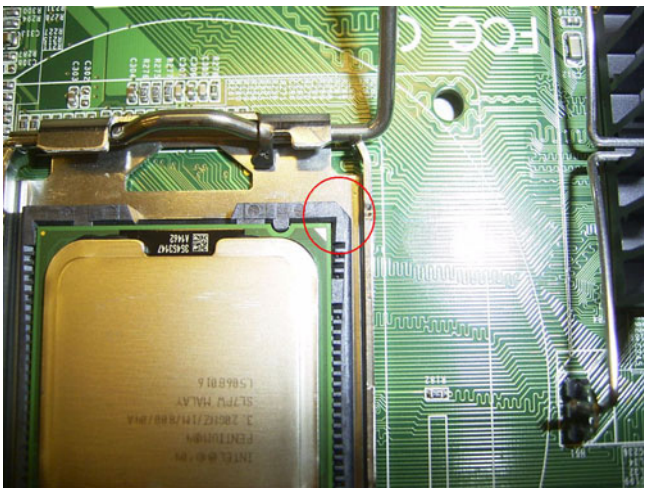
1.12 Processor Installation

The PCA-6010 is designed for Intel® LGA 775 socket CPUs.

Step 1: Pull the bar beside the CPU socket outward and lift it.



Step 2: Align the triangular marking on the processor with the cut edge of the socket.



Step 3: Put back the socket cap and press down the bar to fix it.

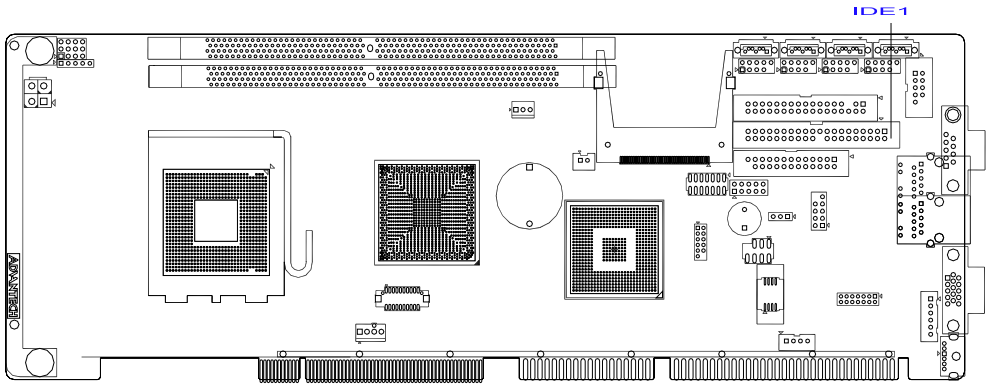
Chapter 2

Connecting Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 IDE Connectors (IDE1)



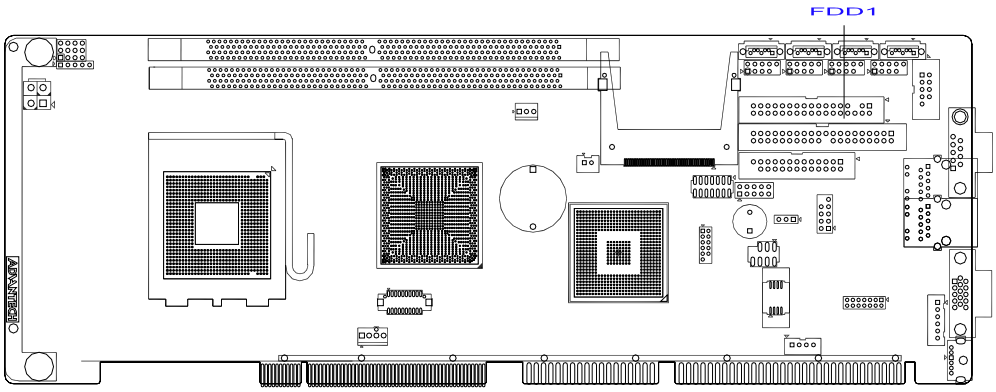
You can attach up to two IDE (Integrated Drive Electronics) drives to the PCA-6010's built-in controller.

Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector IDE1 on the single board computer. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each drive as the master. See the documentation that came with your drive for more information.

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

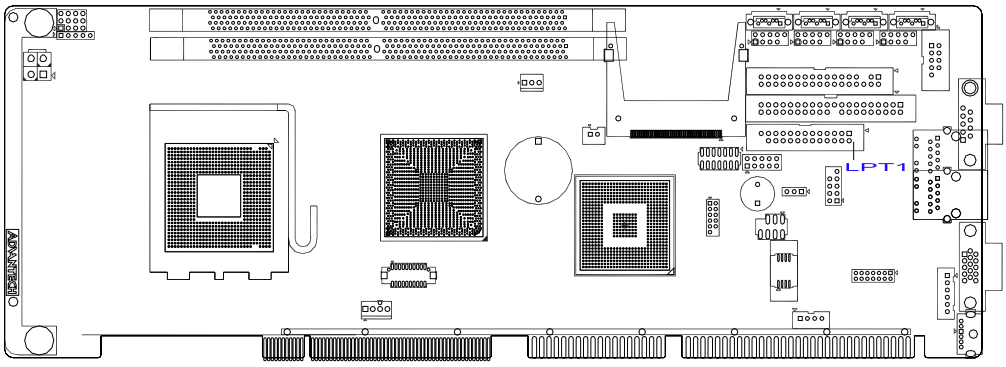
2.3 Floppy Drive Connector (FDD1)



You can attach up to two floppy disk drives to the PCA-6010's on board controller. You can use 3.5" (720 KB, 1.44 MB) drives.

The single board computer comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two 34-pin flat-cable connectors (usually used for 3.5" drives). The one on the end (after the twist in the cable) connects to the A: floppy drive. The one in the middle connects to the B: floppy drive.

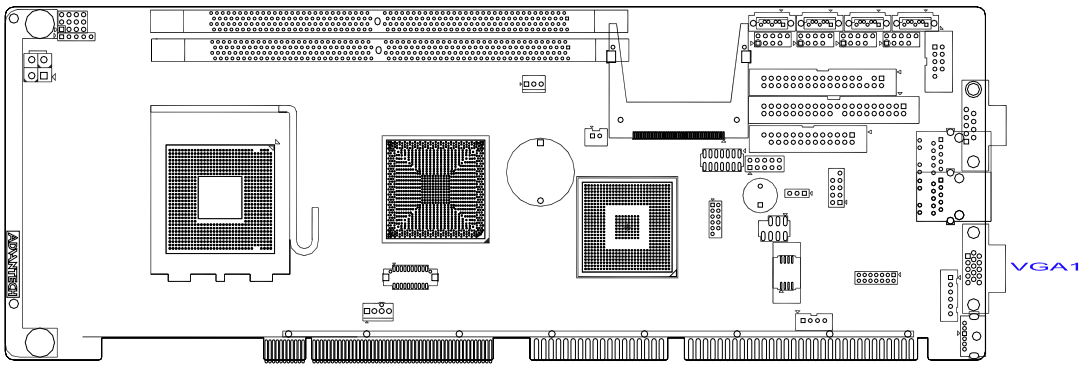
2.4 Parallel Port (LPT1)



The parallel port is normally used to connect the single board computer to a printer. The PCA-6010 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

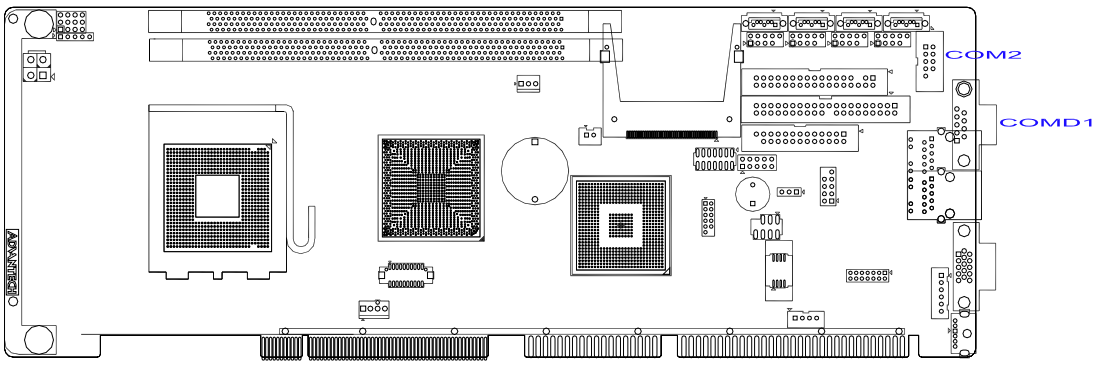
To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to LPT1 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of LPT1. Pin 1 is on the upper right side of LPT1.

2.5 VGA Connector (VGA1)



The PCA-6010 includes a VGA interface that can drive conventional CRT displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector VGA1 are detailed in Appendix B.

2.6 Serial Ports (COM1, COM2)

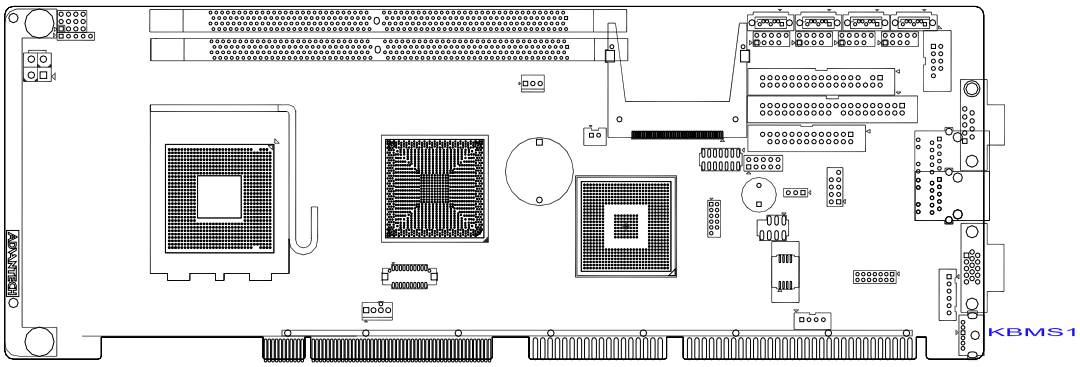


The PCA-6010 offers two serial ports COM1, COM2. These ports can connect to serial devices, such as a mouse or to a communications network.

The IRQ and address ranges for all ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.

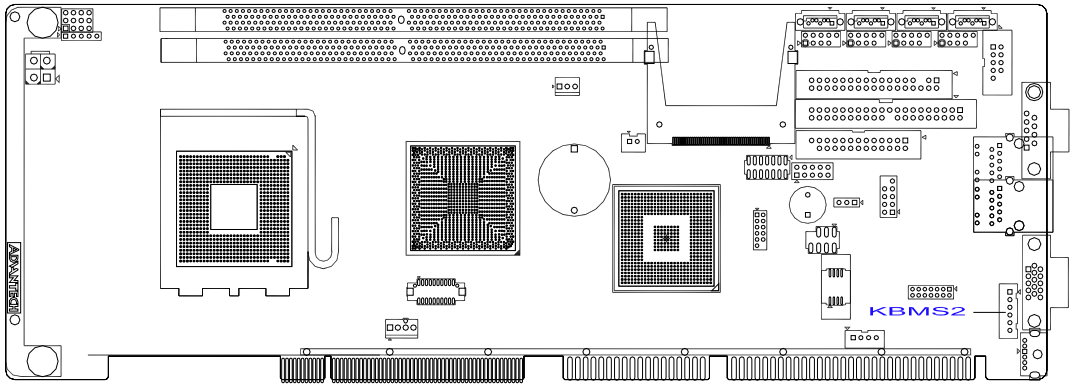
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.7 PS/2 Keyboard and Mouse Connector (KBMS1)



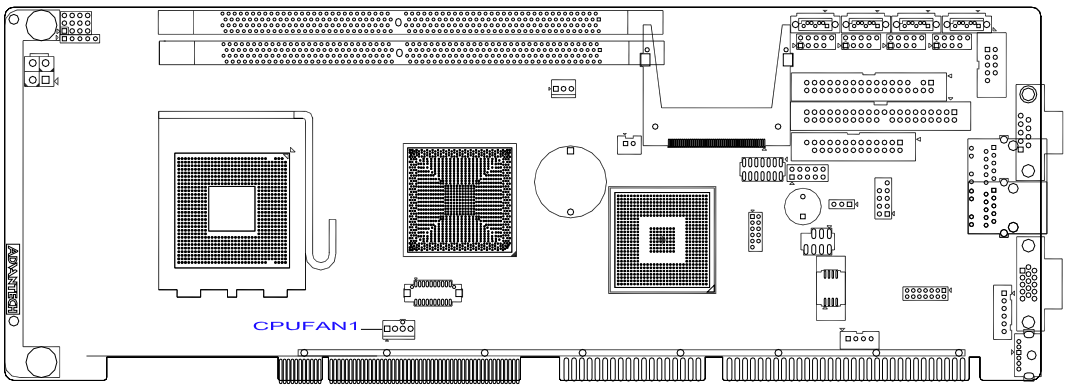
One 6-pin mini-DIN connectors (KBMS1) on the card mounting bracket provide connection to a PS/2 keyboard or a PS/2 mouse, respectively. KBMS1 can also be connected to an adapter cable (P/N: 1700060202) for connecting to both a PS/2 keyboard and a PS/2 mouse.

2.8 External Keyboard & Mouse (KBMS2)



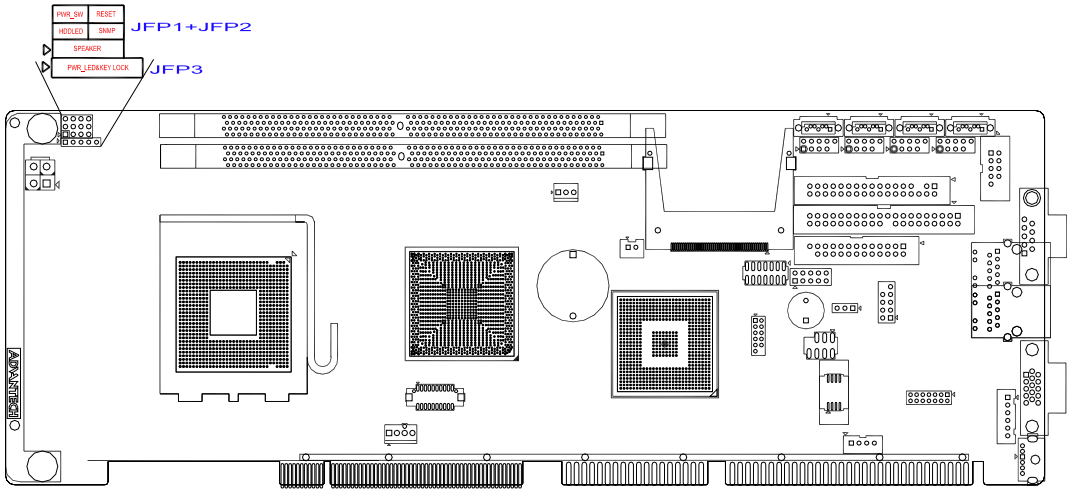
In addition to the PS/2 mouse/keyboard connector on the PCA-6010's rear plate, there is also an extra onboard external keyboard and mouse connector. This gives system integrators greater flexibility in designing their systems.

2.9 CPU Fan Connector (CPUFAN1)



If a fan is used, this connector supports cooling fans of 12 V/1 A (12 W) or less.

2.10 Front Panel Connectors (JFP1, JFP2, JFP3)



There are several external switches to monitor and control the PCA-6010.

2.10.1 ATX soft power switch (JFP1 / PWR_SW)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to (JFP1 / PWR_SW). This connection enables you to turn your computer on and off.

2.10.2 Reset (JFP1 / RESET)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.10.3 HDD LED (JFP2 / HDDLED)

You can connect an LED to connector (JFP2 / HDDLED) to indicate when the HDD is active.

2.10.4 SM Bus Connector (JFP2 / SNMP)

This connector is reserved for Advantech's SNMP-1000 HTTP/SNMP Remote System Manager. The SNMP-1000 allows users to monitor the internal voltages, temperature and fans from a remote computer through an Ethernet network.

(JFP2 / SNMP) can be connected to CN19 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin 2 to pin 2 on both ends of cable.

2.10.5 External speaker (JFP2 / SPEAKER)

(JFP2 / SPEAKER) is a 4-pin connector for an external speaker. If there is no external speaker, the PCA-6010 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

2.10.6 Power LED and keyboard lock connector (JFP3 / PWR_LED&KEY LOCK)

(JFP3 / PWR_LED&KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5.

There are 3 modes for the power supply connection. The first is "ATX power mode", where the system is turned on/off by a power button. The second is "AT Power Mode", where the system is turned on/off by the switch on the power supply. The third is another "AT Power Mode" which uses the front panel power switch. The power LED status is indicated as per the following table:

Table 2.1: ATX Power Supply LED Status (No support for AT Power)

Power Mode	**LED (ATX Power Mode)** (On/off by tentative button)	**LED (AT power Mode)** (On/off by switching power supply)	**LED (AT power Mode)** (On/off by front panel switch)
PSON1(On Back plane) Jumper setting	Connect 3 pin ATX signal cable	1-2 pin closed	Connect 1-2 pin cable with switch
System On	On	On	On
System Suspend	Fast flashes	Fast flashes	Fast flashes
System Off	Slow flashes	Off	Off

2.11 H/W Monitor Alarm (JOBS1)

(JOBS1) is a 2-pin jumper to enable/disable the alarm for on board security events.

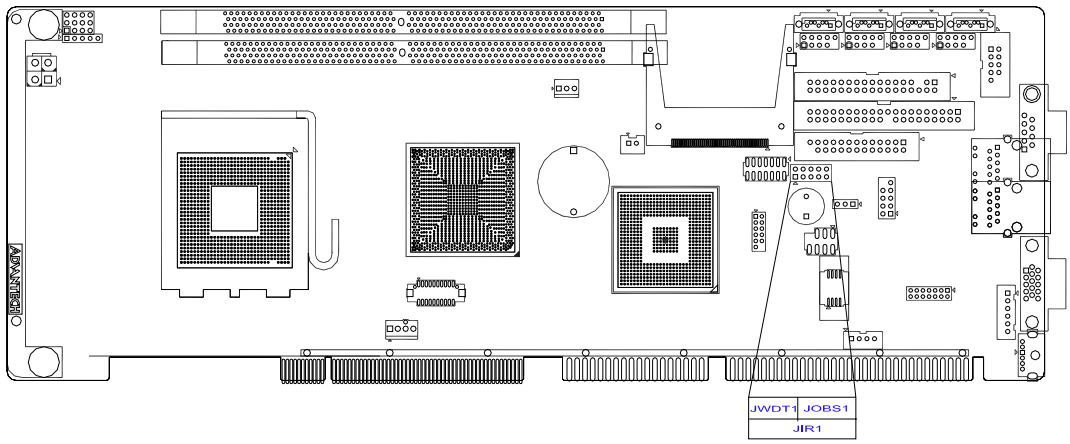
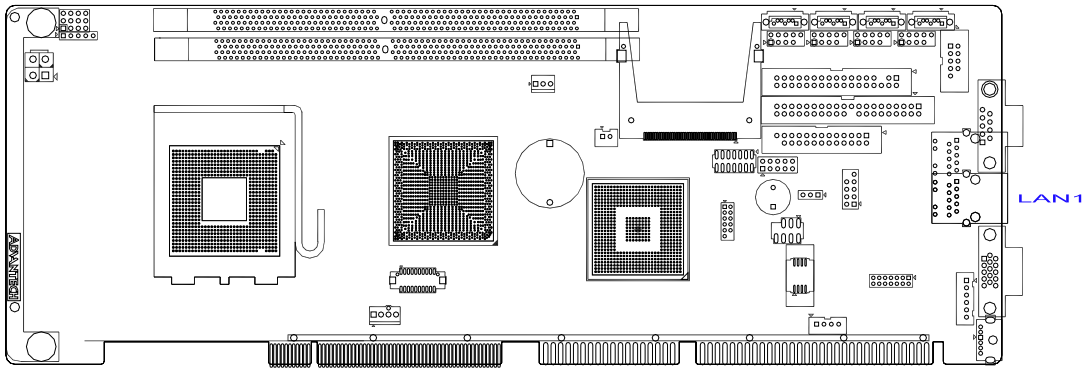


Table 2.2: Hardware Monitor Alarm setting

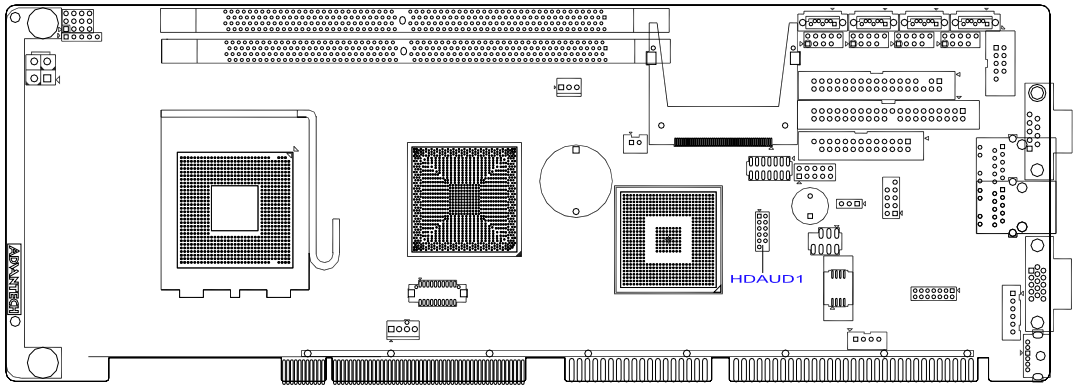
Pin setting	Function
closed	Enable OBS alarm
open	Disable OBS alarm

2.12 LAN RJ45 connector (LAN1)



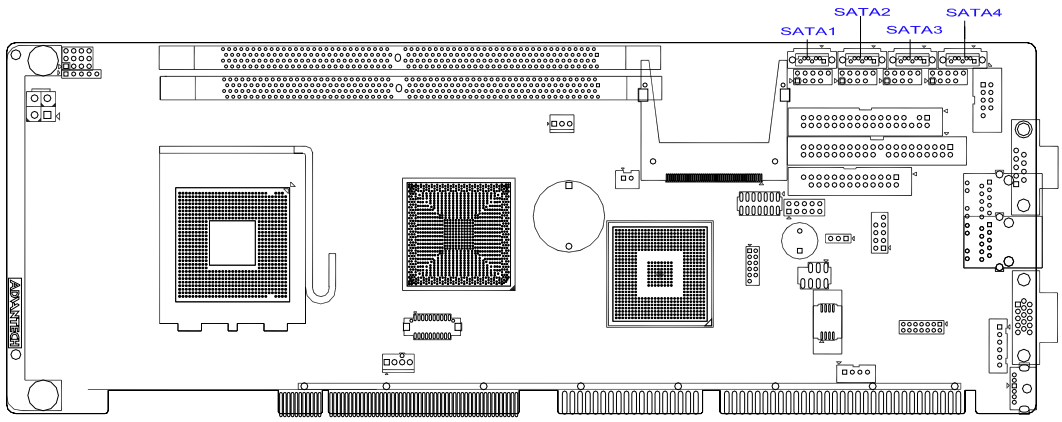
PCA-6010 uses the Intel 82574L Gigabit LAN chip which is linked to PCIe x1 Link. With this chip, PCA-6010 may provide high throughputs for a heavy load networking environment. It provides one or two RJ-45 connectors in the rear side and is convenient for most industrial applications.

2.13 HD Link connector (HDAUD1)



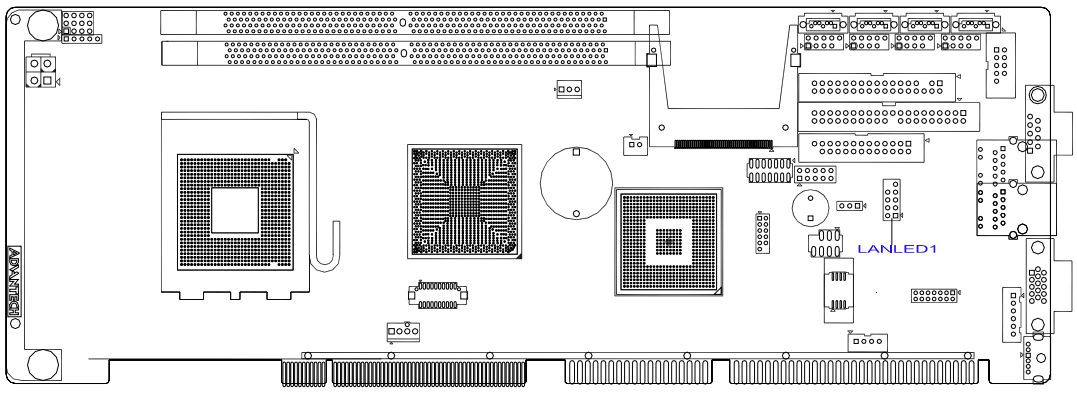
The PCA-6010 provides HD audio through PCA-AUDIO-HDA1 module from Advantech.

2.14 Serial ATA2 Interface (SATA1 ~ SATA4)



In addition to the EIDE interfaces (up to two devices), the PCA-6010 features a high performance serial ATA2 interface (up to 300MB/s) which eases cabling to hard drives with thin and long cables.

2.15 LAN LED connector (LAN LED1)



PCA-6010 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users can easily see whether the LAN port is active or not. Refer to Appendix B for detailed information on the pin assignments.

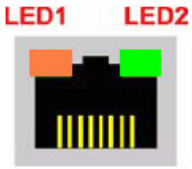
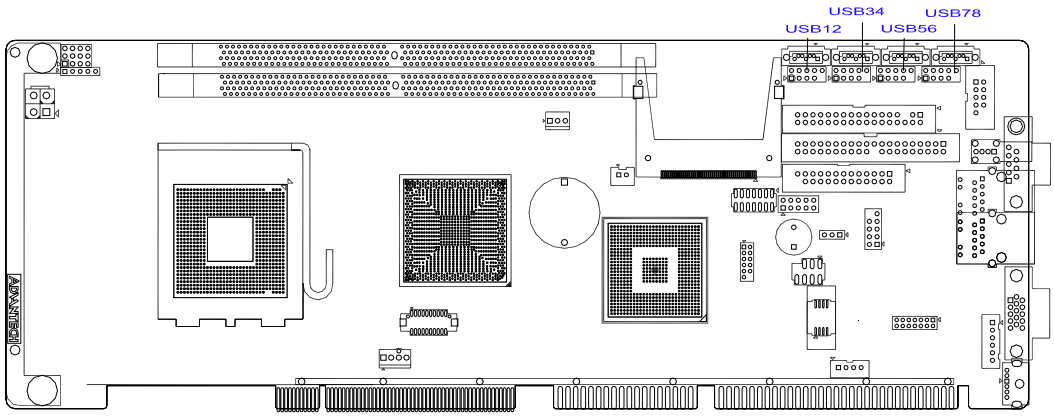


Table 2.3: Front Panel LAN indicator connector

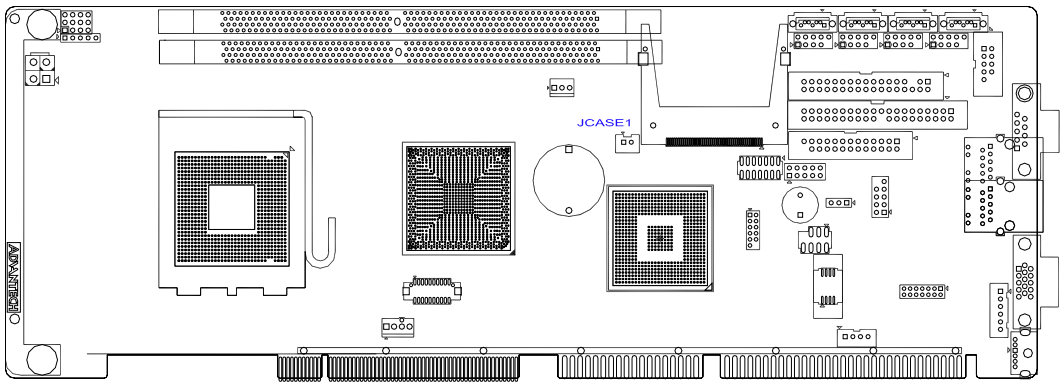
LAN Mode	LED1	LED2
1000Mbps Link On	Green On	On
1000Mbps Active	Green on	Green Flashes
1000Mbps Link Off	Off	Off
100Mbps Link On	Orange On	Green On
100Mbps Active	Orange On	Green Flashes
100Mbps Link Off	Off	Off
10Mbps Link On	Off	Green On
10Mbps Active	Off	Green Flashes
10Mbps Link Off	Off	Off

2.16 USB (USB12, USB34, USB56, USB78)



The PCA-6010 provides eight on board USB 2.0 ports which support transmission rates up to 480 Mbps and which are fuse-protected. To install the USB cable (p/n: 1700008461) bracket, find an empty slot in your chassis and unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate.

2.17 Case open (JCASE1)



PCA-6010 provides 2-Pins pin header for case open detection. This function could be enabled or disabled in the BIOS setting. When the PIN is shorted, it will cause the on board buzzer to sound.

Chapter 3

Award BIOS Setup

3.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery backed-up memory (CMOS RAM) so that it retains the setup information when the power is turned off.

3.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environments causes a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note! *If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..." message appears again and again, please check to see if you need to replace the battery in your system.*

3.2 Entering Setup

Turn on the computer and press <Del> to enter the BIOS setup.

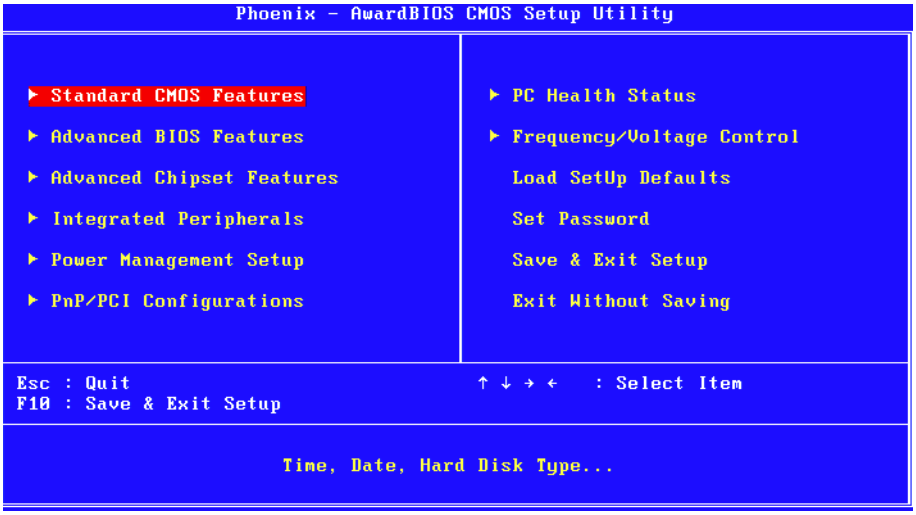


Figure 3.1 Award BIOS setup initial screen

3.3 Standard CMOS Setup

- **Date**
  The date format is <week>, <month>, <day>, <year>.
- **Time**
  The time format is <hour> <minute> <second>, based on the 24-hour clock.
- **IDE channel 0/1 Master/Slave**
  - **IDE HDD Auto-Detection:** Press “Enter” to select this option for automatic device detection.
  - **IDE Device Setup:**
    Auto: Automatically detects IDE devices during POST
    None: Select this when no IDE device is used. The system will skip the auto-detection step to make system start up faster.
    Manual: User can manually input the correct settings.
  - **Access Mode:** The options are CHS/LBA/Large/Auto
  - **Capacity:** Capacity of currently installed hard disk.
  - **Cylinder:** Number of cylinders
  - **Head:** Number of heads
  - **Precomp:** Write precomp
  - **Landing Zone:** Landing zone
  - **Sector:** Number of sectors
- **Drive A / Drive B**
  This category identifies the types of floppy disk drives installed in the system. The options are: None/360K, 5.25"/1.2M, 5.25"/720K, 3.5"/1.44M, 3.5"/2.88M, 3.5".
- **Halt On**
  This category determines whether system start-up will halt or not when an error is detected during power up.
  The options are: No Errors/All Errors/All, But Keyboard/All, But Diskette/All, But Disk/Key
- **Memory**
  This category displays base memory, extended memory, and total memory detected during POST (Power On Self Test).

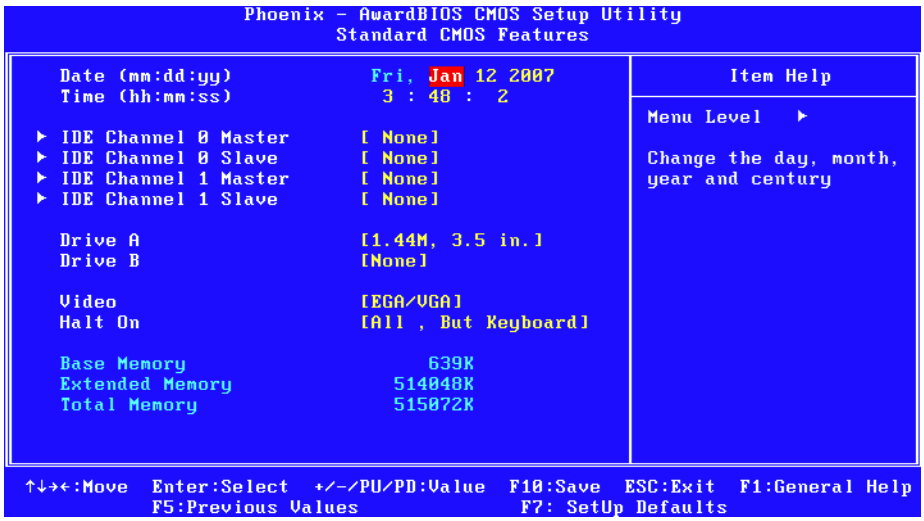

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Fri, Jan 12 2007
Time (hh:mm:ss) 3 : 48 : 2
IDE Channel 0 Master [None]
IDE Channel 0 Slave [None]
IDE Channel 1 Master [None]
IDE Channel 1 Slave [None]
Drive A [1.44M, 3.5 in.]
Drive B [None]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 639K
Extended Memory 514048K
Total Memory 515072K
Item Help
Menu Level ▸
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.2 Standard CMOS features screen

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the PCA-6010 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.

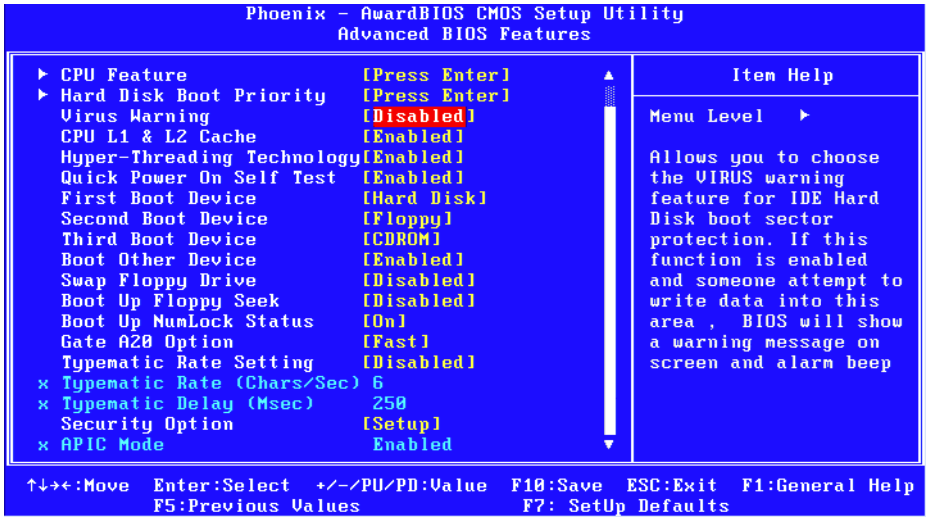

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
▶ CPU Feature [Press Enter]
▶ Hard Disk Boot Priority [Press Enter]
Virus Warning [Disabled]
CPU L1 & L2 Cache [Enabled]
Hyper-Threading Technology [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [Floppy]
Third Boot Device [CDROM]
Boot Other Device [Enabled]
Swap Floppy Drive [Disabled]
Boot Up Floppy Seek [Disabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Typematic Rate Setting [Disabled]
x Typematic Rate (Chars/Sec) 6
x Typematic Delay (Msec) 250
Security Option [Setup]
x APIC Mode Enabled
Item Help
Menu Level ▶
Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area , BIOS will show a warning message on screen and alarm beep
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.3 Advanced BIOS features screen

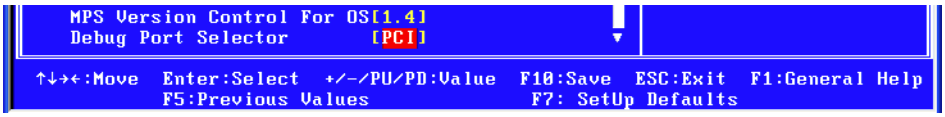

MPS Version Control For OS [1.4]
Debug Port Selector [PCI]
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.4 Advanced BIOS features screen (Conn.)

- **CPU Features**
  - **Delay Prior to thermal**
    This feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up. The choices are 4 Min, 8 Min, 16 Min, and 32 Min.
  - **Limit CPUID MaxVal**
    Set Limit CPUID MaxVa1 to 3. This should be disabled for WinXP.
  - **C1E Function**
    "Enabled" or "Disabled" C1E function.
  - **Execute Disable Bit**
    When disabled, forces the XD feature flag to always return 0.
  - **Virtualization Technology**
    "Enabled" and "Disabled" the Virtualization Technology
- **Hard Disk Boot Priority**
  Set hard disk boot device priority.
- **Virus Warning**
  Enables or disables the virus warning.

- **CPU L1& L2 Cache**
  Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”
- **Hyper-Threading Technology**
  While using a CPU with Hyper-Threading technology, you can select “Enabled” to enable Hyper-Threading Technology in an OS which supports Hyper-Threading Technology or select “Disabled” for other OSs which do not support Hyper-Threading technology.
- **Quick Power On Self Test**
  This allows the system to skip certain tests to speed up the boot-up procedure.
- **First/Second/Third Boot Device**
  The BIOS tries to load the OS with the devices in the sequence selected. Choices are: “Floppy”, “LS120”, “Hard Disk”, “CDROM”, “ZIP100”, “USB-FDD”, “USB-ZIP”, “USB-CDROM”, “LAN1”, “LAN2” and “Disabled”.
- **Boot Other Device**
  Use this to boot another device. The options are “Enabled” and “Disabled”.
- **Swap Floppy Drive**
  If the system has two floppy drives, choose “Enabled” to assign physical drive B to logical drive A and vice-versa. The commands are “Enabled” or “Disabled”.
- **Boot Up Floppy Seek**
  Selection of the command “Disabled” will speed the boot up. Selection of “Enabled” searches disk drives during boot up.
- **Boot Up NumLock Status**
  Sets the boot up status Num Lock. The options are “On” and “Off”.
- **Gate A20 Option**
  “Normal”: A pin in the keyboard controller controls GateA20. Fast (Default) lets chipset control GateA20.
- **Typematic Rate Setting**
  The typematic rate is the rate key strokes repeat when a keypress is held. The commands are “Enabled” or “Disabled”. Enabling allows the typematic rate and delay to be selected.
- **Typematic Rate (Chars/Sec)**
  The BIOS accepts the following input values (characters/second) for typematic auto repeat rate: 6, 8, 10, 12, 15, 20, 24, and 30.
- **Typematic Delay (msec)**
  Typematic delay is the keypress time interval before auto repetition begins. The input values for this category are: 250, 500, 750, and 1000 (ms).
- **Security Option**
  This category determines whether the password is required when the system boots up or only when entering setup. The options are:
  - **System:** The system will not boot, and access to Setup will be also denied unless the correct password is entered at the prompt.
  - **Setup:** The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

Note! *To disable security, select PASSWORD SETTING in the main menu. Then, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot and you can enter Setup freely.*

- **APIC Mode**
  This setting allows you to enable the APIC mode. The choices are “Disabled” or “Enabled.”
- **MPS Version Control For OS**
  This setting allows you to select the MPS version.The choices are "1.1” or "1.4".
- **Debug Port Selector: PCI**
  Select port 80 error code forward to PCI/LPC.

3.5 Advanced Chipset Features

By choosing the “Advanced Chipset Features” option from the “Initial Setup Screen” menu, the screen below will be displayed. This sample screen contains the manufacturer’s default values for the PCA-6010, as shown in Figure 3.4:

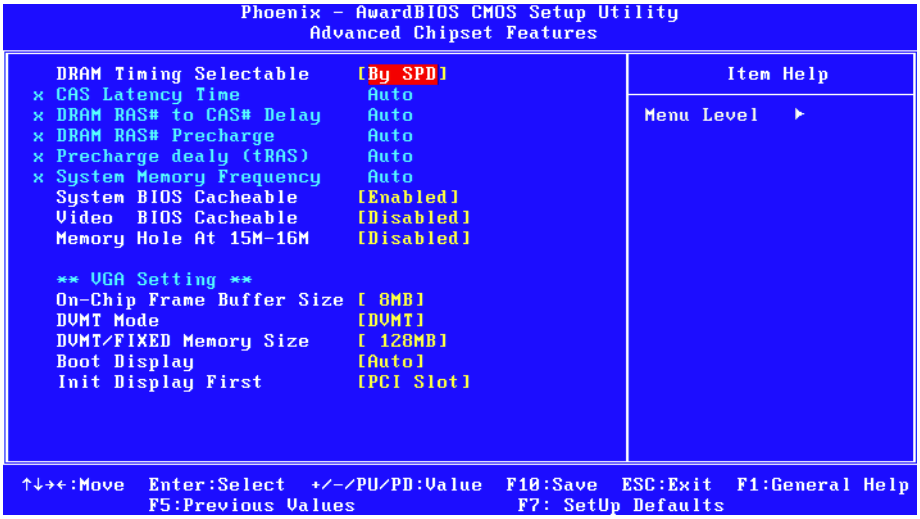

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
DRAM Timing Selectable [By SPD]
x CAS Latency Time Auto
x DRAM RAS# to CAS# Delay Auto
x DRAM RAS# Precharge Auto
x Precharge dealy (tRAS) Auto
x System Memory Frequency Auto
System BIOS Cacheable [Enabled]
Video BIOS Cacheable [Disabled]
Memory Hole At 15M-16M [Disabled]
** VGA Setting **
On-Chip Frame Buffer Size [8MB]
DVMT Mode [DVMT]
DVMT/FIXED Memory Size [128MB]
Boot Display [Auto]
Init Display First [PCI Slot]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.5 Advanced chipset features screen

Note! *DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical support.*

- **DRAM Timing Selectable**
  This item allows you to control the DRAM speed. The selections are “Manual” or “By SPD”.
- **CAS Latency Time**
  When DRAM Timing Selectable is set to [Manual], this field is adjustable. This controls the CAS latency, which determines the time interval between SDRAM starting a read command and receiving it. The options are [3T], [4T], [5T], [6T] and [Auto].
- **DRAM RAS# to CAS# Delay**
  When DRAM Timing selectable is set to [Manual], this field is adjustable. When DRAM is refreshed, the rows and columns are addressed separately. This setup item allows users to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles are, the faster the DRAM speed is. Setting options are [2T] to [6T], and [Auto].

- **DRAM RAS# Precharge**

  When the DRAM Timing Selectable is set to [Manual], this field is adjustable. This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If no sufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options are [2T] to [6T], and [Auto].

- **Precharge Delay (RAS)**

  This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The choices are: “4” to “15” and “Auto”.

- **System Memory Frequency**

  To adjust the frequency of memory. The choices are: “400 MHz”, “533 MHz”, “667 MHz”, and “Auto”.

- **System BIOS Cacheable**

  Selecting “Enabled” allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes data to this memory area, a system error may occur. The choices are “Enabled”, and “Disabled”.

- **Video BIOS Cacheable**

  Selecting “Enabled” allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The choices are “Enabled”, and “Disabled”.

- **Memory Hole At 15M-16M**

  Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is “Disabled”.

- **On-Chip Frame Buffer Size**

  The On-Chip Frame Buffer Size can be set to 1 MB or 8 MB. This memory is shared with the system memory.

- **DVMT Mode**

  Displays the active system memory mode.

- **DVMT / FIXED Memory Size**

  Specify the size of DVMT / FIXED system memory to allocate for video memory.

- **Init Display First**

  Choose the first display interface to initiate while booting. The choice is “PCI Slot” or “Onboard”.

3.6 Integrated Peripherals

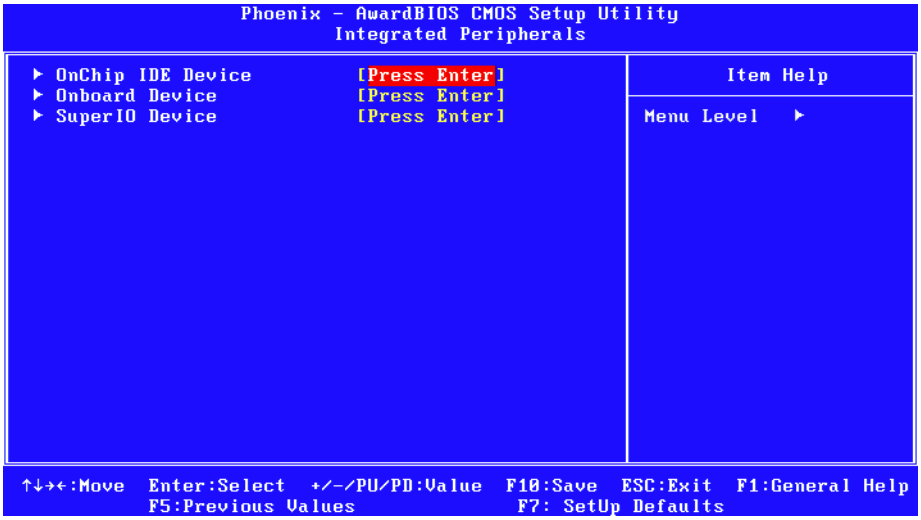

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
Onboard Device [Press Enter]
SuperIO Device [Press Enter]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.6 Integrated peripherals

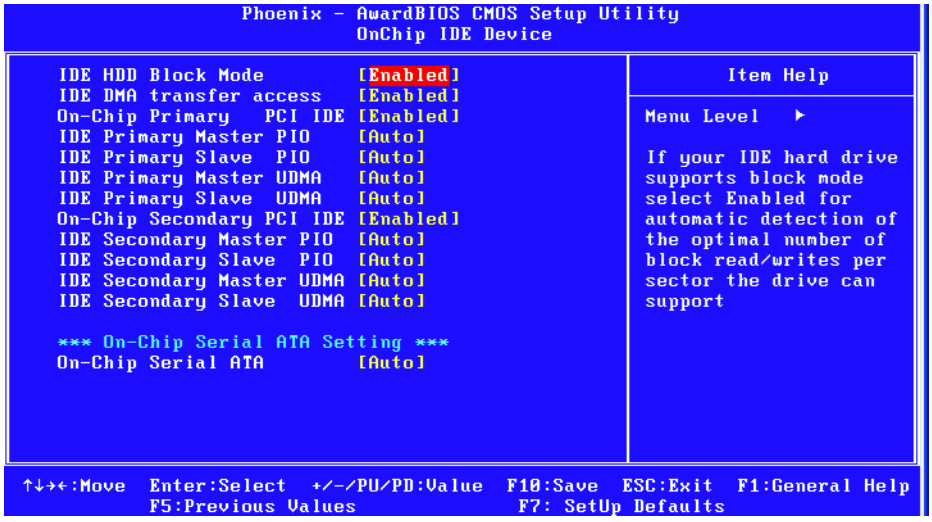

Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
IDE DMA transfer access [Enabled]
On-Chip Primary PCI IDE [Enabled]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
On-Chip Secondary PCI IDE [Enabled]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]
*** On-Chip Serial ATA Setting ***
On-Chip Serial ATA [Auto]
Item Help
Menu Level ▶
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.7 On-Chip IDE device

- **IDE HDD Block Mode**

  If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

- **IDE DMA Transfer Access**

  Use this field to enable or disable IDE DMA transfer access.

- **On-Chip Primary / Secondary IDE Device**

  IDE Primary Master/Slave PIO/UDMA Mode (Auto). The channel has both a master and a slave, making four IDE devices possible. Because two IDE devices may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting “Auto” will allow auto detection to ensure optimal performance.

- **On-Chip Serial ATA**

  Choose the status of serial ATA. The default setting is “Auto” which lets the system arrange all parallel and serial ATA resources automatically. The “Disabled” setting disables the SATA controller. The “Combined Mode” combines PATA and SATA, and maximum of 2 IDE drives in each channel. The “Enhanced Mode” enables both SATA and PATA, and a maximum of 6 IDE drives are supported. The “SATA Only” setting means SATA is operating in legacy mode.

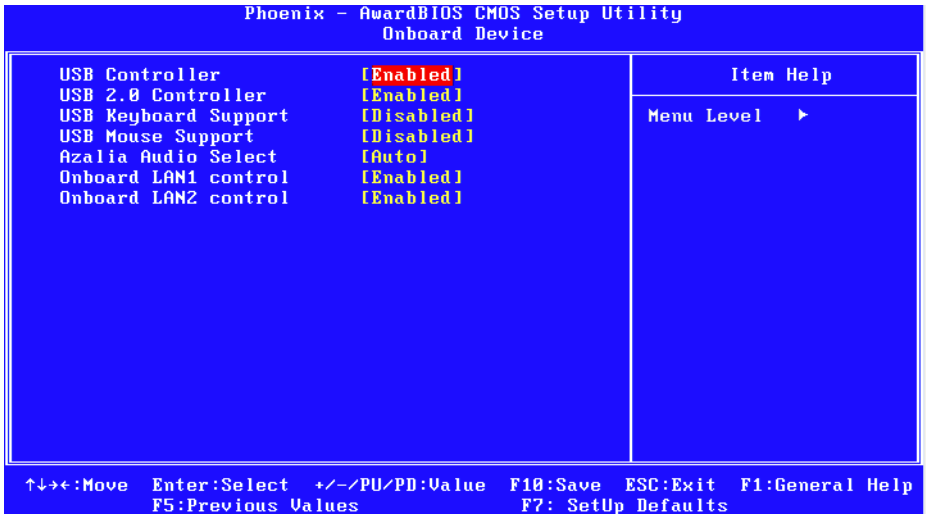

Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device
USB Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Keyboard Support [Disabled]
USB Mouse Support [Disabled]
Azalia Audio Select [Auto]
Onboard LAN1 control [Enabled]
Onboard LAN2 control [Enabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.8 Onboard device

- **USB Controller**

  Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices are “Enabled” and “Disabled”.

- **USB 2.0 Controller**

  This entry is to disable/enable the USB 2.0 controller only. The BIOS itself may/may not have high-speed USB support. If the BIOS has high speed USB support built in, the support will automatically turn on when a high speed device is attached. The choices are “Enabled” or “Disabled”.

- **USB Keyboard / Mouse Support**

  Select Enabled if you plan to use an USB keyboard. The choices are “Enabled” and “Disabled”.

- **Azalia Audio Select**

  Select “Disable” if you do not want to use audio.

- **Onboard LAN1 Control**

  Options are “Enabled” and “Disabled”. Select “Disabled” if you don’t want to use onboard LAN controller1.

- **Onboard LAN2 Control (Optional)**

  Options are “Enabled” and “Disabled”. Select Disabled if you don’t want to use the onboard LAN controller2.

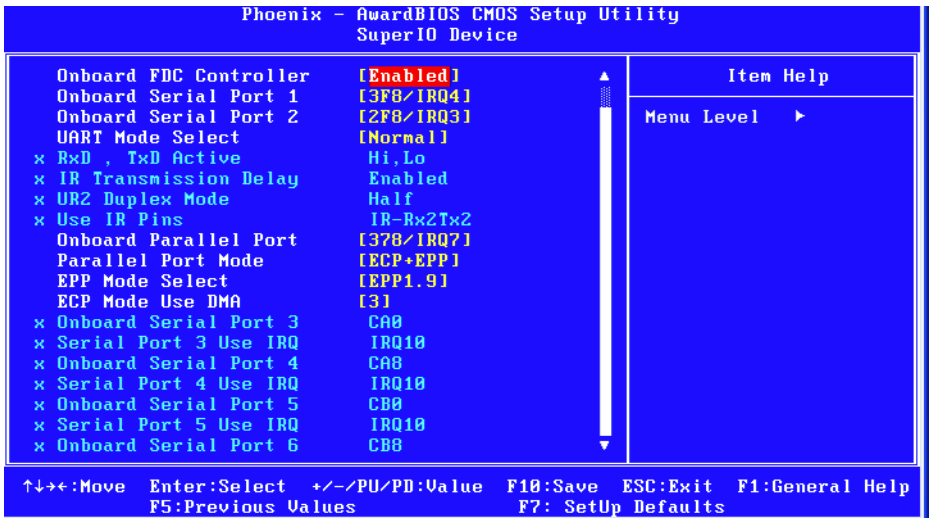

Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device
Onboard FDC Controller [Enabled]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
UART Mode Select [Normal]
x RxD , TxD Active Hi,Lo
x IR Transmission Delay Enabled
x UR2 Duplex Mode Half
x Use IR Pins IR-Rx2Tx2
Onboard Parallel Port [378/IRQ7]
Parallel Port Mode [ECP+EPP]
EPP Mode Select [EPP1.9]
ECP Mode Use DMA [3]
x Onboard Serial Port 3 CA0
x Serial Port 3 Use IRQ IRQ10
x Onboard Serial Port 4 CA8
x Serial Port 4 Use IRQ IRQ10
x Onboard Serial Port 5 CB0
x Serial Port 5 Use IRQ IRQ10
x Onboard Serial Port 6 CB8
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.9 Super I/O device

x Serial Port 6 Use IRQ IRQ10
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.10 Super I/O device (Conn.)

- **Onboard FDC Controller**

  When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

- **Onboard Serial Port 1**

  The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.

- **Onboard Serial Port 2**

  The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.

- **UART Mode Select**

  This item allows you to select UART mode. The choices: “IrDA”, “ASKIR”, and “Normal”.

- **RxD, TxD Active**

  This item allows you to determine the active level of the RxD and TxD serial lines. The Choices: “Hi, Hi”, “Lo, Lo”, “Lo, Hi”, and “Hi, Lo”.

- **IR Transmission Delay**

  This item allows you to enable/disable IR transmission delay. The choices are “Enabled” and “Disabled”.

- **UR2 Duplex Mode**

  This item allows you to select the IR half/full duplex function. The choices are “Half” and “Full”.

- **Use IR Pins**

  The choices are “RxD2, TxD2” and “IR-Rx2Tx2”.

- **Onboard Parallel Port**

  This field sets the address of the on-board parallel port connector. You can select “378/IRQ7”, “278/IRQ5”, “3BC/IRQ7”, or “Disabled”. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The single board computer can support up to three parallel ports.

- **Parallel Port Mode**

  This field allows you to set the operation mode of the parallel port. The setting “Normal” allows normal speed operation, but in one direction only. “EPP” allows bi-directional parallel port operation at maximum speed. “ECP” allows the parallel port to operate in bi-directional mode and at a speed faster than the maximum data transfer rate. “ECP + EPP” allows normal speed operation in a two-way mode.

- **EPP Mode Select**

  This field allows you to select EPP port type 1.7 or 1.9. The choices are “EPP1.9” and “EPP1.7”.

- **ECP Mode Use DMA**

  This selection is available only if you select “ECP” or “ECP + EPP” in the Parallel Port Mode field. In ECP Mode, you can select DMA channel 1 or DMA channel 3. Leave this field on the default setting.

- **Onboard Serial Port 3 (Optional)**

  The settings are "CA0", CA8" and “Disabled” for the on-board serial connector 3.

- **Series port 3 use IRQ**

  The settings are "IRQ10", "IRQ11" and "Disabled" for the on-board serial connector 3.

- **Onboard Serial Port 4 (Optional)**

  The settings are "CA0", CA8" and “Disabled” for the on-board serial connector 4.

- **Series port 4 use IRQ**

  The settings are "IRQ10", "IRQ11" and "Disabled" for the on-board serial connector 4.

- **Onboard Serial Port 5 (Optional)**

  The settings are "CA0", "CA8" and "Disabled" for the on-board serial connector 5.

- **Series port 5 use IRQ**

  The settings are "IRQ10", "IRQ11" and "Disabled" for the on-board serial connector 5.

- **Onboard Serial Port 6 (Optional)**

  The settings are "CA0", "CA8" and "Disabled" for the on-board serial connector 6.

- **Series port 6 use IRQ**

  The settings are "IRQ10", "IRQ11" and "Disabled" for the on-board serial connector 6.

3.7 Power Management Setup

The power management setup controls the single board computer's “green” features to save power. The following screen shows the manufacturer defaults.

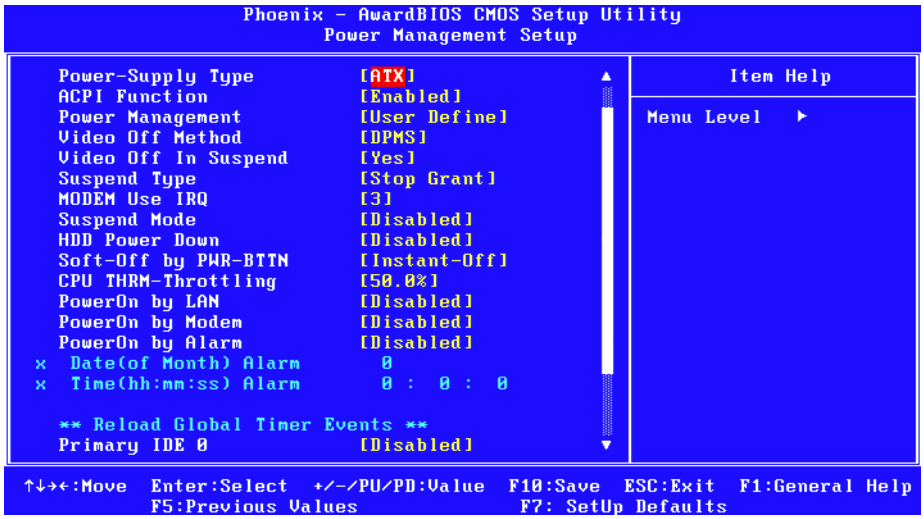

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
Power-Supply Type [ATX]
ACPI Function [Enabled]
Power Management [User Define]
Video Off Method [DPMS]
Video Off In Suspend [Yes]
Suspend Type [Stop Grant]
MODEM Use IRQ [3]
Suspend Mode [Disabled]
HDD Power Down [Disabled]
Soft-Off by PWR-BTTN [Instant-Off]
CPU THRM-Throttling [50.0%]
PowerOn by LAN [Disabled]
PowerOn by Modem [Disabled]
PowerOn by Alarm [Disabled]
x Date(of Month) Alarm 0
x Time(hh:mm:ss) Alarm 0 : 0 : 0
** Reload Global Timer Events **
Primary IDE 0 [Disabled]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.11 Power management setup screen

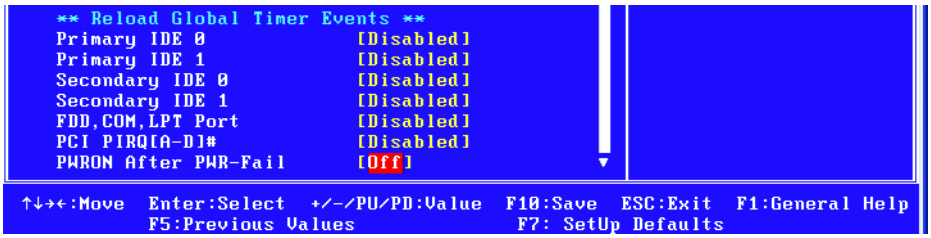

** Reload Global Timer Events **
Primary IDE 0 [Disabled]
Primary IDE 1 [Disabled]
Secondary IDE 0 [Disabled]
Secondary IDE 1 [Disabled]
FDD,COM,LPT Port [Disabled]
PCI PIRQ[A-D]# [Disabled]
PWRON After PWR-Fail [Off]
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.12 Power management setup screen (Conn.)

- **PCI express PM Function**

  This is to setup PCI Express's PME function “Enable” or “Disable”.

- **Power Supply Type**

  PCA-6010 can support both “ATX” and “AT” power supplies. Customers can choose the PSU type through this selection. The choices are “ATX” and “AT”. Selecting “AT” disables the ACPI function automatically.

- **ACPI Function**

  The choices are: “Enabled” and “Disabled”.

- **Power Management**

  This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

  – HDD Power Down
  – Suspend Mode
  – There are three selections for Power Management, and they have fixed mode settings.

Table 3.1: Power Saving

Saving Mode	Function
Min Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min., and disabled.

- **Video Off Method**
  Use this to select the method to turn off the video. The choices are “Blank Screen”, “V/H SYNC+ Blank”, and “DPMS”.
- **Video Off In Suspend**
  When the system is in suspend mode, the video will turn off. The choices are “No” and “Yes”.
- **Suspend Type**
  The choices are “Stop Grant” and “PwrOn Suspend”.
- **Modem Use IRQ**
  This determines the IRQ that the MODEM can use.The choices are “3”, “4”, “5”, “7”, “9”, “10”, “11”, and “NA”.
- **Suspend Mode**
  Please refer to Table 3.1.
- **HDD Power Down**
  Please refer to Table 3.1.
- **Soft-Off by PWR-BTTN**
  If you choose “Instant-Off”, then pushing the ATX soft power switch button once will switch the system to “system off” power mode. You can choose “Delay 4 sec”. If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to “suspend” mode.
- **CPU THRM-Throttling**
  The ability is control how much percent of your CPU's clock speed will be throttled down when the CPU overheat. You can set "75.0%", "50.0%", and "25.0%".
- **PowerOn by LAN**
  This item allows you to power on the system by LAN. The choices are “Enabled” and “Disabled”.
- **PowerOn by Modem**
  To enabled or disable the function to power on the system via a Modem connection from a remote host. The choice “Enabled” and “Disabled”.
- **PowerOn by Alarm**
  The choices are “Enabled” and “Disabled”. Fields that follow below indicate date of current month and time of alarm settings, if enabled.
- **Primary IDE 0 (1) and Secondary IDE 0 (1)**
  When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) becomes active. The choices are “Enabled” and “Disabled”.

- **FDD, COM, LPT PORT**
  When Enabled, the system will resume from suspend mode if the FDD, interface, COM port, or LPT port is active. The choices are “Enabled” and “Disabled”.
- **PCI PIRQ [A-D]#**
  When Enabled, the system resumes from suspend mode if an interrupt occurs. The choices are “Enabled” and “Disabled”.
- **PWRON After PWR-Fail**
  Use this to set up the system after power failure. The “Off” setting keeps the system powered off after power failure, the “On” setting boots up the system after failure, and the “Former-Sts” returns the system to the status before power failure.

3.8 PnP/PCI Configurations

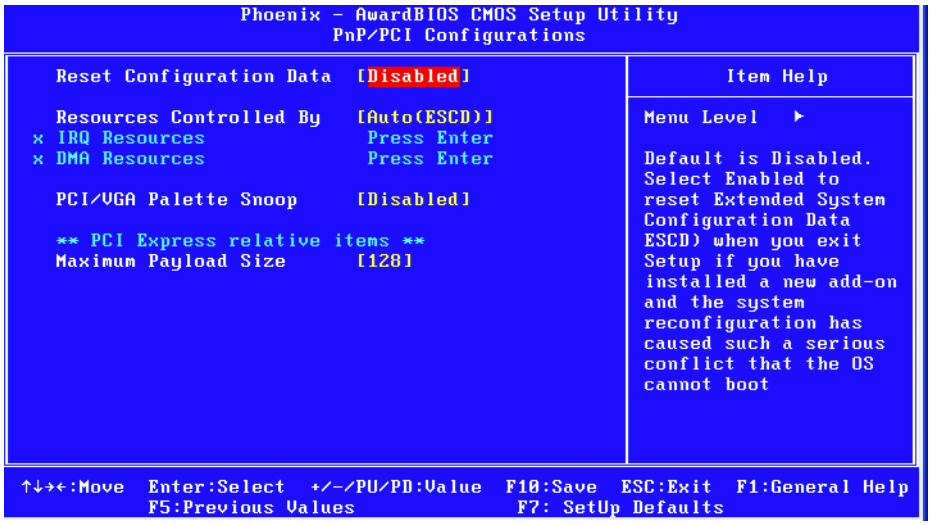

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
x DMA Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▶
Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.13 PnP/PCI configurations screen

- **Reset Configuration Data**
  The default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.
- **Resources Controlled By**
  The commands here are “Auto (ESCD)” or “Manual”. Choosing “Manual” requires you to choose resources from the following sub-menu. “Auto (ESCD)” automatically configures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.
- **PCI / VGA Palette Snoop**
  This is set to “Disabled” by default.
- **Maximum Payload Size**
  This allows you to set the maximum TLP payload size for PCI Express devices. The options are [128 bytes].

3.9 PC Health Status

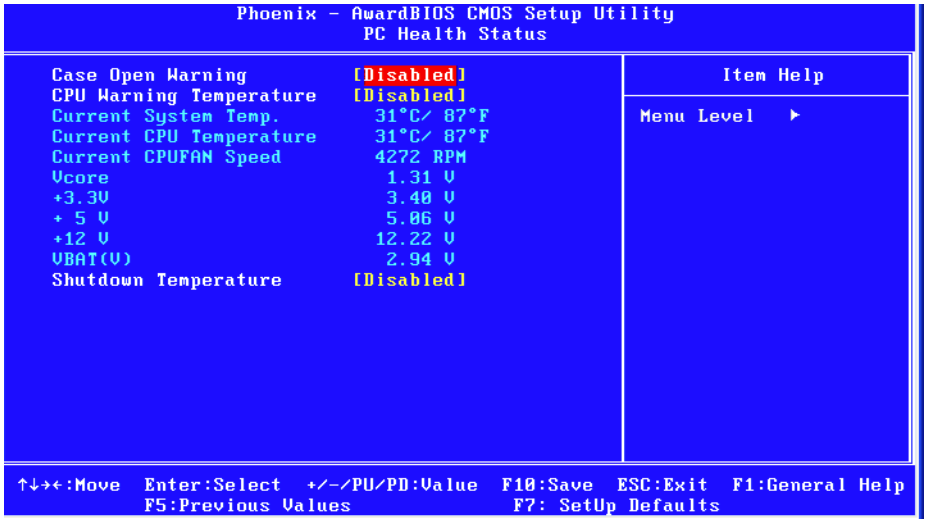

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status
Case Open Warning [Disabled]
CPU Warning Temperature [Disabled]
Current System Temp. 31°C/ 87°F
Current CPU Temperature 31°C/ 87°F
Current CPUFAN Speed 4272 RPM
Vcore 1.31 V
+3.3V 3.40 V
+ 5 V 5.06 V
+12 V 12.22 V
VBAT(V) 2.94 V
Shutdown Temperature [Disabled]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.14 PC health status screen

- **Case Open Warning**
  Enable this to detect if the case is open or closed.
- **CPU Warning Temperature**
  This item will prevent the CPU from overheating. The choices are “Disabled”, "50C/122F", "53C/127F", "56C/133F", “60C/140F”, “63C/145F”, “66C/151F”, “70C/158F”.
- **Current System Temperature**
  This shows you the current temperature of system.
- **Current CPU Temperature**
  This shows the current CPU temperature.
- **CPU FAN Speed**
  This shows the current CPU FAN operating speed.
- **VCORE and Other Voltages**
  This shows the voltage of VCORE, +3.3 V, +5 V and +12 V, VBAT (V).
- **Shutdown Temperature**
  The system will shut down automatically when the CPU temperature is over the selected setting. This function can prevent CPU damage caused by overheating.

3.10 Frequency / Voltage Control

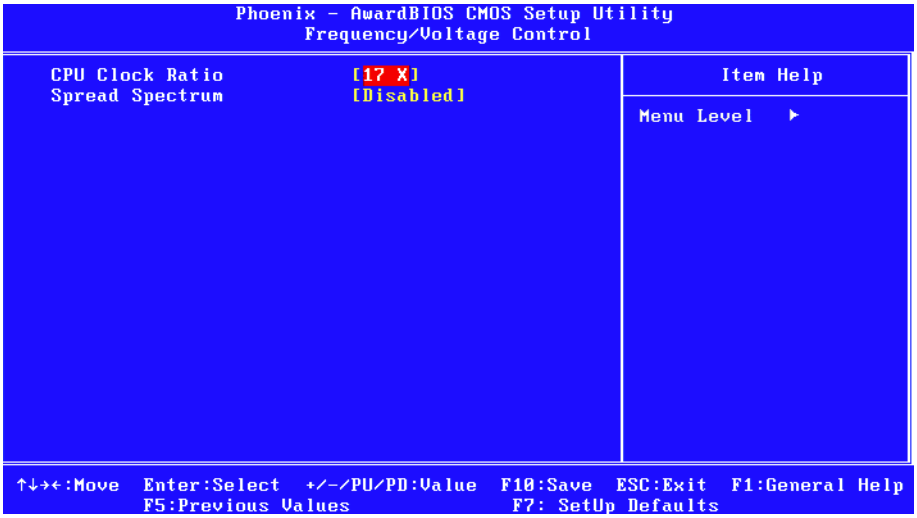

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control
CPU Clock Ratio [17 X]
Spread Spectrum [Disabled]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: SetUp Defaults

Figure 3.15 Spread spectrum control screen

- **CPU Clock Ratio**

  Type a DEC number to set up the CPU Clock Ratio. This item only shows up in special situations.

- **Spread Spectrum**

  This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The choices are “Disabled” and “Enabled”.

3.11 Password setting

Follow these steps to change the password.

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>. The screen displays the following message:

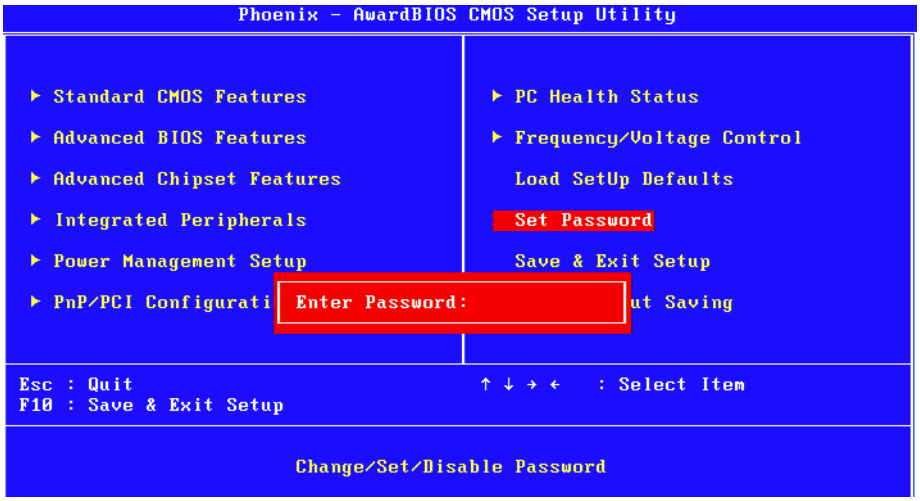


Figure 3.16 Enter password

2. Fill in the password, and press <Enter>.
3. Please confirm your password, type the current password and press <Enter>.
4. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored. The password must be no longer than eight (8) characters.

3.12 Load Setup Defaults

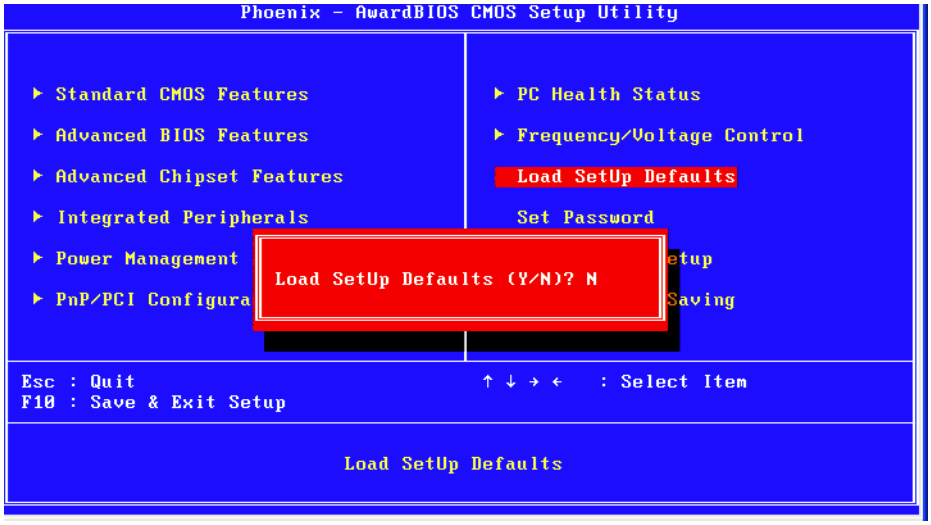


Figure 3.17 Load setup defaults screen

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:

Load setup Defaults (Y/N)? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

3.13 Save & Exit Setup

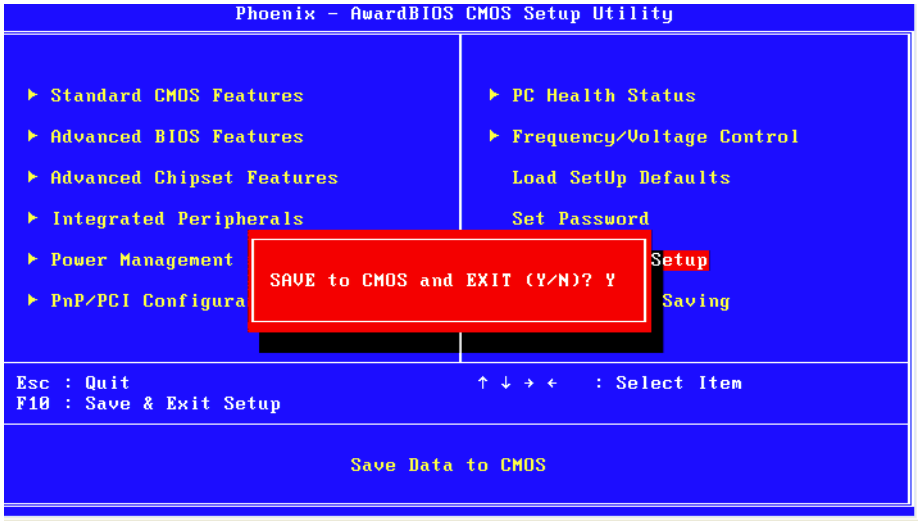


Figure 3.18 Save to CMOS and Exit

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The processor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.14 Exit Without Saving

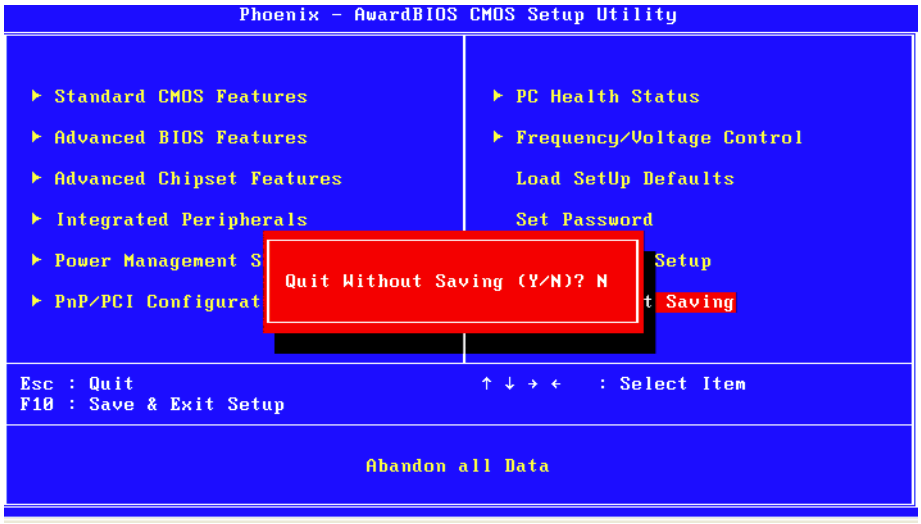


Figure 3.19 Quit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

Chapter 4

Chipset Software Installation Utility

4.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the PCA-6010 are located on the software installation CD. The Intel® Chipset Software Installation Utility is not required on any systems running Windows NT 4.0. Updates are provided via Service Packs from Microsoft*.

Note! *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI and ISAPNP Services
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel (R) Chipset Components in the Device Manager

Note! *This utility is used for the following versions of Windows system, and it has to be installed before installing all the other drivers:*

- *Microsoft Windows Vista*
- *Microsoft Windows Vista x64 Edition*
- *Microsoft Windows XP Professional x64 Edition*
- *Microsoft Windows XP with Service Pack 2*
- *Microsoft Windows 2000 with Service Pack 4*

4.3 Windows XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. Select the folder "Intel INF" then click "infinst_autol.exe". A message pops up telling you to install the CSI utility before other device drivers. Windows XP is used as an example in the following steps.
2. Click “Next” when you see the following message.

Intel® Chipset Device Software
Intel® Chipset Device Software
Welcome to the Setup Program
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.
< Back
Next >
Cancel
Intel® Installation Framework

3. Click “Yes” when you see the following message.

Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

4. Click “Next” when you see the following message.

Intel® Chipset Device Software
Intel® Chipset Device Software
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.
****
* Product: Intel(R) Chipset Device Software
* Release: Production Version
* Version: 9.0.0.1008
* Target Chipset#: Intel(R) 4 Series Chipset
* Date: May 01 2008
****
< Back
Next >
Cancel
Intel® Installation Framework

5. Click "Next" when you see the following message.

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Progress
Please wait while the following setup operations are performed:
Installing Driver: Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
Version: 8.2.0.1008
Installing Driver: Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
Version: 8.2.0.1008
Installing Driver: Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
Version: 8.2.0.1008
Installing Driver: Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
Version: 8.2.0.1008
Click Next to continue.
Next
Intel® Installation Framework

6. When the following message appears, click “Finish” to complete the installation and restart Windows.

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
intel
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Chapter 5

VGA Setup

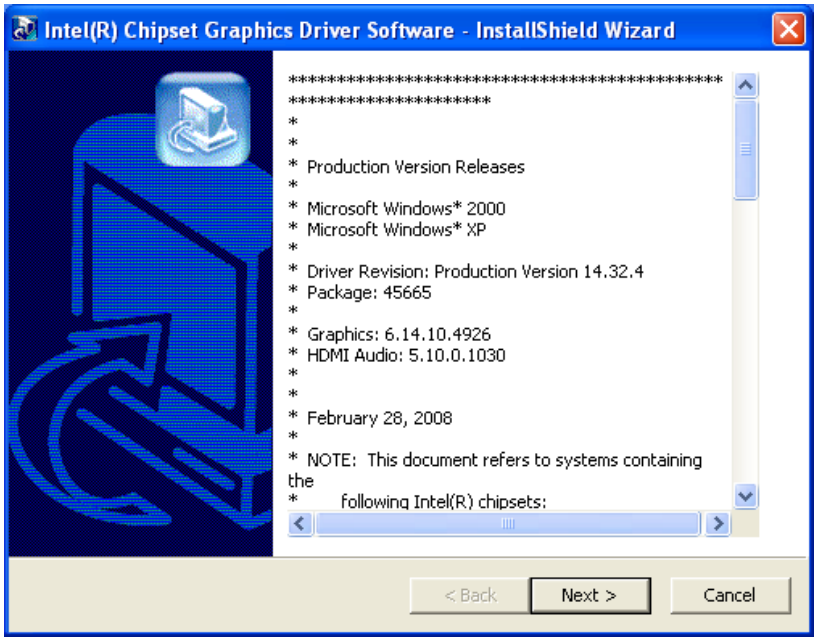
5.1 Introduction

The Intel 945GC integrated graphics controller provides an analog display port. You need to install the VGA driver to enable the function. The Intel 945GC integrated graphics controller incorporates the latest Microsoft* DirectX*9 support capabilities. It allows software developers to create life like environments and characters. Enhanced display modes for widescreen flat panels, and optimized 3D support deliver an intense and realistic visual experience without requiring a separate graphics card.

5.2 Windows XP Driver Setup

Note! *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.*

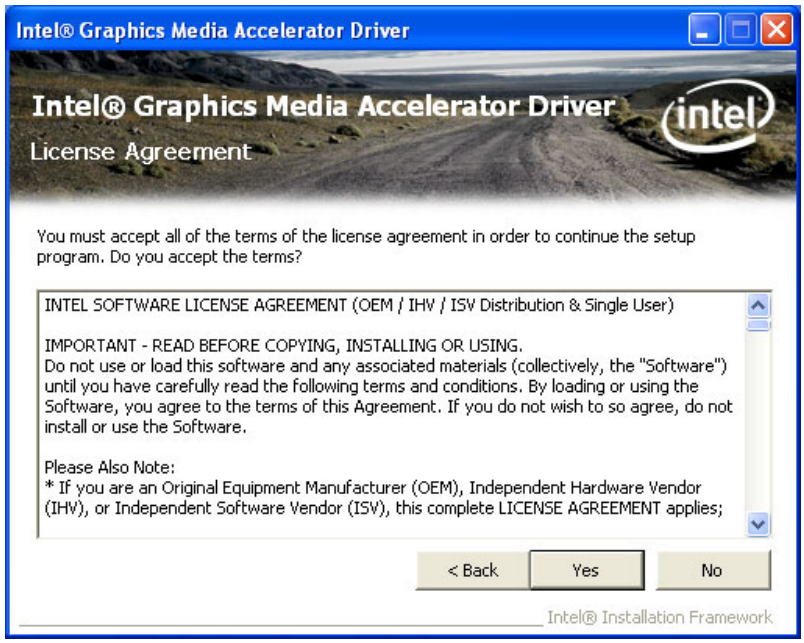
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "VGA" then click the proper VGA driver for the OS. Windows XP is used as an example in the following steps.
2. Click "Next" when you see the following message.


Intel(R) Chipset Graphics Driver Software - InstallShield Wizard
****
* Production Version Releases
* Microsoft Windows* 2000
* Microsoft Windows* XP
* Driver Revision: Production Version 14.32.4
* Package: 45665
* Graphics: 6.14.10.4926
* HDMI Audio: 5.10.0.1030
* February 28, 2008
* NOTE: This document refers to systems containing the
* following Intel(R) chipsets:
< Back
Next >
Cancel

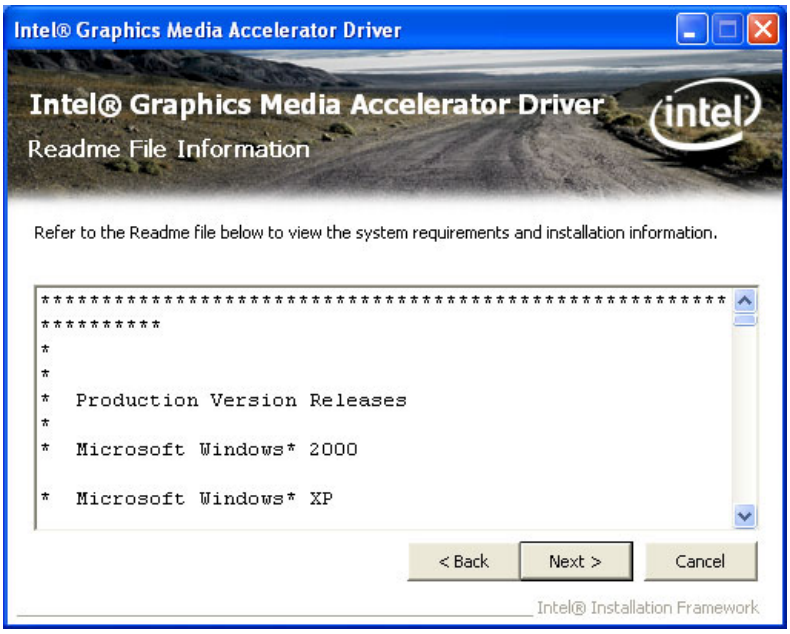
3. You will see a welcome window. Please click "Next" to continue the installation.

Intel® Graphics Media Accelerator Driver
Intel® Graphics Media Accelerator Driver
Welcome to the Setup Program
This setup program will install the Intel® Graphics Media Accelerator Driver onto this computer. It is strongly recommended that you exit all programs before continuing. Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

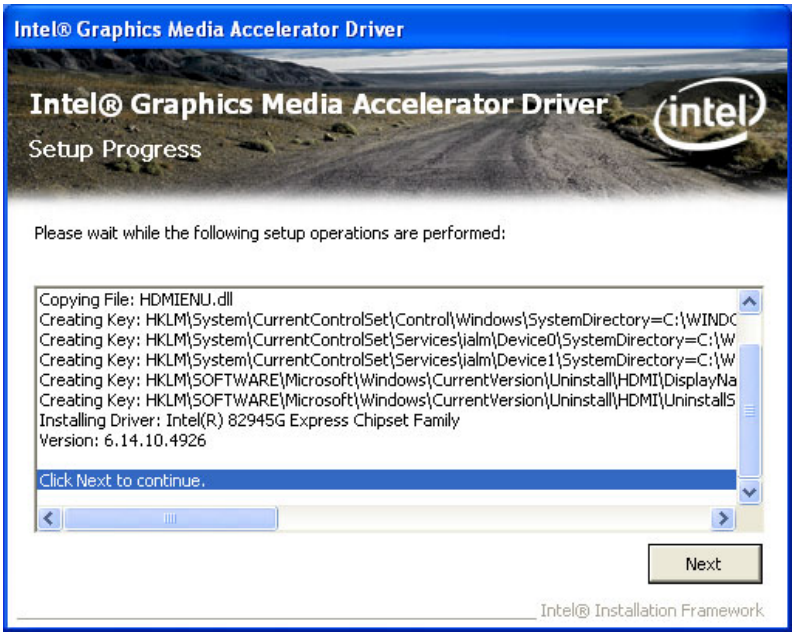
4. Click "Yes" when you see the following message.


Intel® Graphics Media Accelerator Driver
Intel® Graphics Media Accelerator Driver
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

5. When you see the following message , please click "Next" to continue the installation.



6. Please click "Next" to continue the installation.



7. Click “Finish” to complete the installation and restart the computer now or later.

Intel® Graphics Media Accelerator Driver
Intel® Graphics Media Accelerator Driver
Setup Is Complete
intel
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Chapter 6

SUSI Setup

6.1 Introduction

The PCA-6010's hardware monitor is based on the Winbond W83627HG chip. SUSI functions monitor key hardware to help you maintain system stability and durability. The PCA-6010 can monitor five sets of positive system voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets that can be monitored include:

- CPU core voltage: 1.3 ~ 1.8 V, according to Intel specifications.
- Main voltage: +5 V, +12 V.

6.2 Windows XP Driver Setup

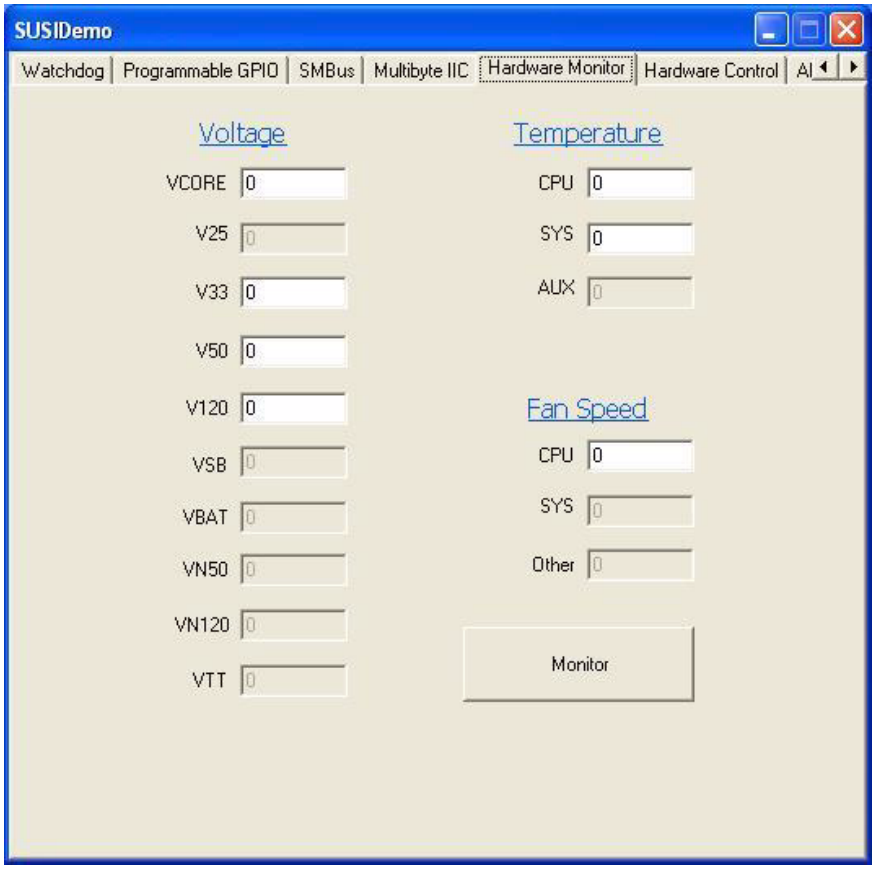
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "SUSI\Driver Installation" then click "install.bat".
2. Copy the folder "SUSI\SusiDemo" to your system hard drive.

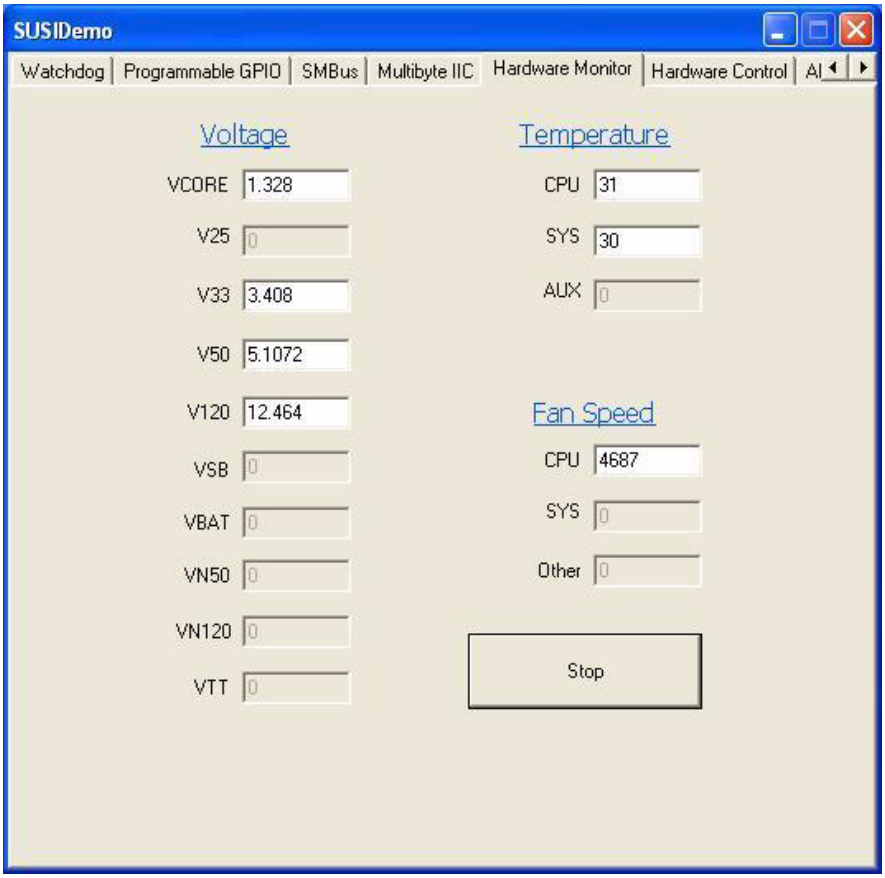
Note! *Before the SUSI setup, please install the Microsoft .NET Framework 2.0 first.*

6.3 Using the SUSI Demo Utility

After completing the setup, all the SUSI functions are permanently enabled.

Select the folder "SUSI\SusiDemo" and double click "SusiDemo.exe". Hardware Monitor will show all values as "0". Click "Monitor" then you can monitor the system information.





Note! *For the latest support list, please check:*
http://www.advantech.com.tw/ess/SUSI.asp

Chapter 7

LAN Configuration

7.1 Introduction

The PCA-6010 has a single Gigabit Ethernet LAN via dedicated PCI Express x 1 bus (Intel® 82574L), which offers bandwidth of up to 500 MB/sec, eliminating the bottle-neck of network data flow and incorporating Gigabit Ethernet to operate at 1000 Mbps.

7.2 Features

- Integrated 10/100/1000 BASE-T transceiver
- 10/100/1000 BASE-T triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

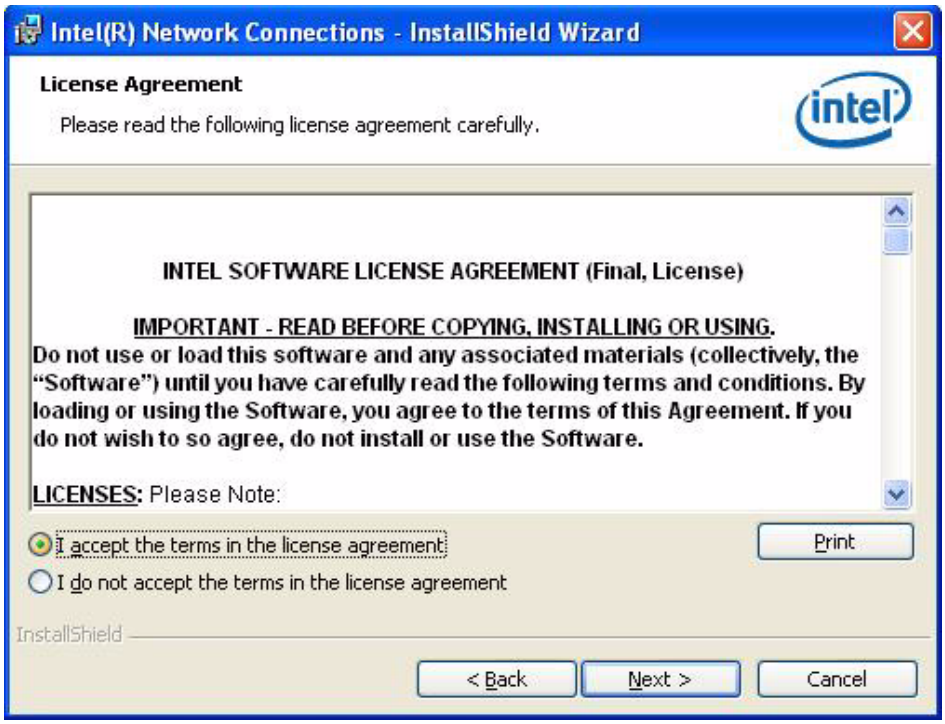
7.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 4 for information on installing the CSI utility.*

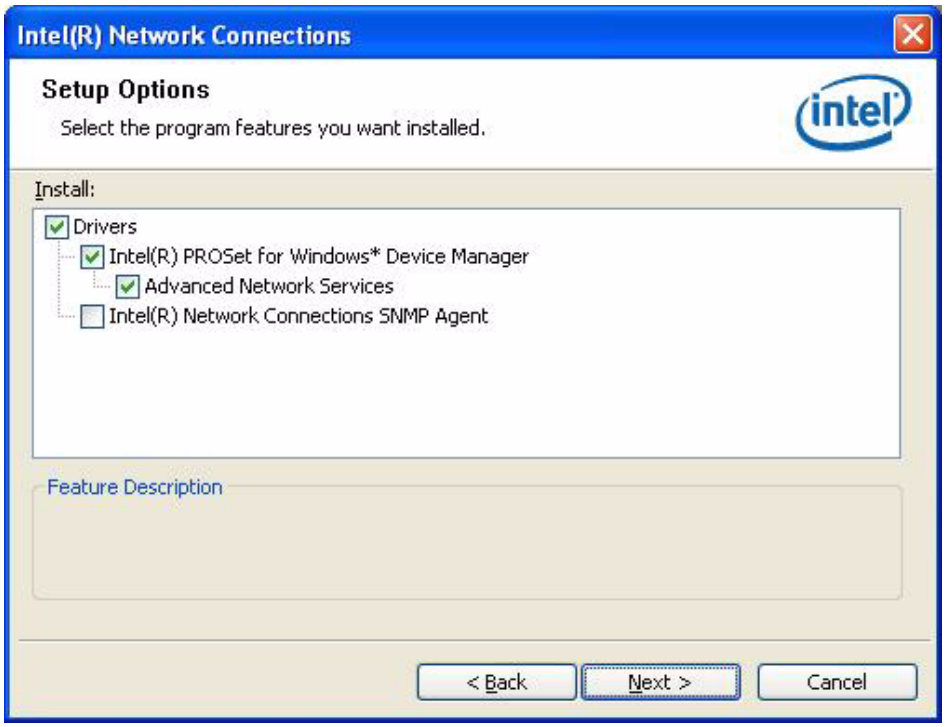
The PCA-6010 Intel 82574L Gigabit integrated controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

7.4 Win XP Driver Setup

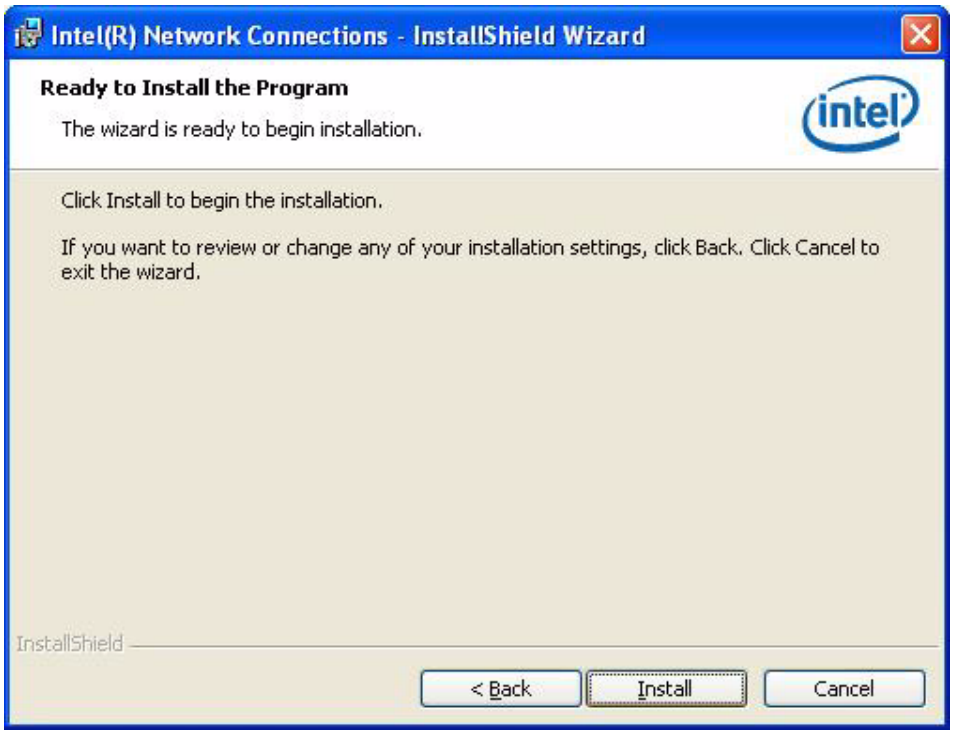
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "LAN" then click the proper LAN driver for the OS. Windows XP is used as an example in the following steps.
2. Select “I accept the terms in the license agreement” and click “Next” to continue.


Intel(R) Network Connections - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT (Final, License)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
LICENSES: Please Note:
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

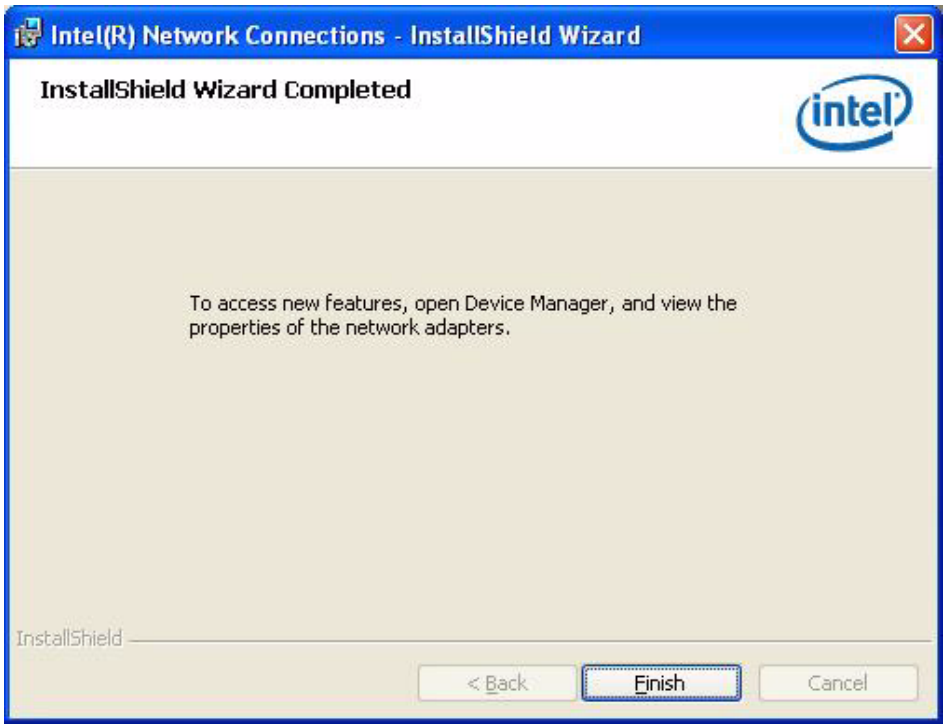
3. Click “Next” to continue.



4. Click “Install” to start the installation procedure.


Intel(R) Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

5. Click "Finish" to complete the installation and the LAN function will be enabled after the installation.


Intel(R) Network Connections - InstallShield Wizard
InstallShield Wizard Completed
To access new features, open Device Manager, and view the properties of the network adapters.
InstallShield
< Back
Finish
Cancel

Appendix A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

The PCA-6010 watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

The watchdog timer is built in to the super I/O controller W83627HG. It provides the following functions for user programming:

- Can be enabled and disabled by user's program.
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes.
- Generates an interrupt or reset signal if the software fails to reset the timer before time-out.

A.1.2 Jumper selection

The JWDT1 jumper is used to select reset in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

A.1.3 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E(hex) and 2F(hex).
2E (hex) is the address port. 2F(hex) is the data port. You must first assign the address of register by writing an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

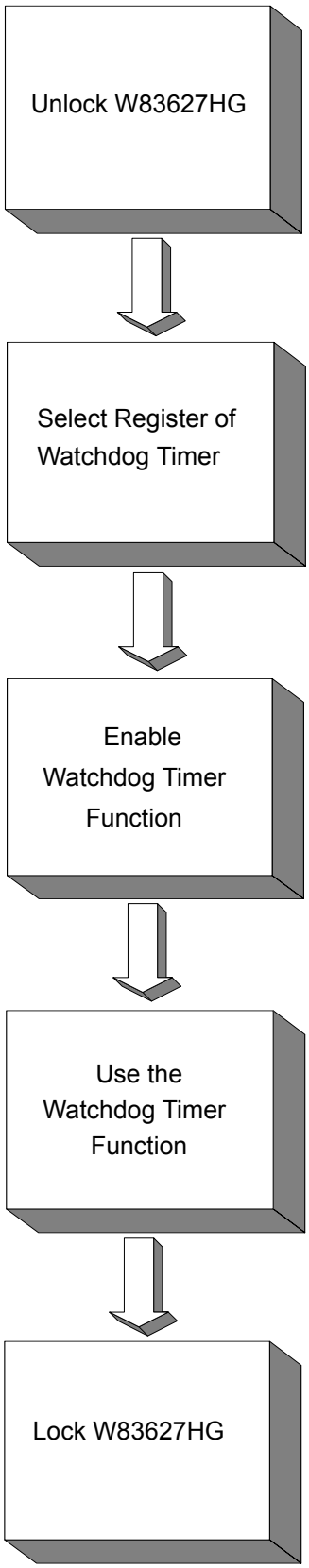

Unlock W83627HG
Select Register of Watchdog Timer
Enable Watchdog Timer Function
Use the Watchdog Timer Function
Lock W83627HG

Table A.1: Watchdog Timer Registers		
Address of Register (2E)	**Attribute**	
Read/Write	Value (2F) & description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627HG
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer.
Write 0 to bit 3: set second as counting unit. [default]		
Write 1 to bit 3: set minutes as counting unit		
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is “timeout”.
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.1.4 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;--------------------------------------------------------
Mov dx,2eh          ; Unlock W83627HG
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;--------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;--------------------------------------------------------
Dec dx              ; Set second as counting unit
Mov     al,0f5h
Out     dx,al
Inc     dx
In      al,dx
And al,not 08h
Out     dx,al
;--------------------------------------------------------
Dec dx              ; Set timeout interval as 10 seconds and start counting
Mov     al,0f6h
Out     dx,al
Inc     dx
Mov     al,10
Out     dx,al
;--------------------------------------------------------
Dec dx              ; lock W83627HG
Mov     al,0aah
Out     dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627HG
Mov al,87h
Out dx,al
Out dx,al
```

```
;--------------------------------------------------------
Mov al,07h              ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; Set minute as counting unit
Mov     al,0f5h
Out     dx,al
Inc     dx
In      al,dx
Or  al,08h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; Set timeout interval as 5 minutes and start counting
Mov     al,0f6h
Out     dx,al
Inc     dx
Mov     al,5
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HG
Mov     al,0aah
Out     dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627HG
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h              ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;--------------------------------------------------------
```

```
Dec dx                  ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;-------------------------------------------------------
Dec dx                  ; Enable watchdog timer to be reset by mouse
Mov     al,0f7h
Out     dx,al
Inc     dx
In      al,dx
Or   al,80h
Out     dx,al
;-------------------------------------------------------
Dec dx                  ; lock W83627HG
Mov     al,0aah
Out     dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;-------------------------------------------------------
Mov dx,2eh          ; unlock W83627HG
Mov al,87h
Out dx,al
Out dx,al
;-------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;-------------------------------------------------------
Dec dx                  ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;-------------------------------------------------------
Dec dx                  ; Enable watchdog timer to be strobed reset by keyboard
Mov     al,0f7h
Out     dx,al
Inc     dx
In      al,dx
Or   al,40h
Out     dx,al
```

```
;--------------------------------------------------------
Dec dx                  ; lock W83627HG
Mov     al,0aah
Out     dx,al
```

5. Generate a time-out signal without timer counting

```
;--------------------------------------------------------
Mov dx,2eh          ; unlock W83627HG
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;--------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; Generate a time-out signal
Mov     al,0f7h
Out     dx,al           ;Write 1 to bit 5 of F7 register
Inc     dx
In      al,dx
Or   al,20h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HG
Mov     al,0aah
Out     dx,al
```

Appendix B

I/O Pin Assignments

B.1 IDE Hard Drive Connector (IDE1)

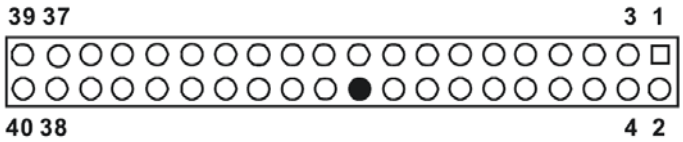


Table B.1: IDE Hard Drive Connector (IDE1)

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	DISK DMA REQUEST	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	CSEL
29	HDACKO*	30	GND
31	IRQ14	32	IDSC16-
33	ADDR 1	34	PDIAG
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND
* low active			

B.2 Floppy Drive Connector (FDD1)

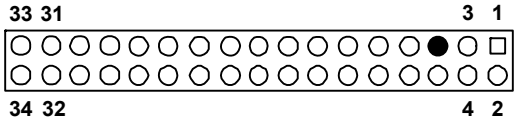


Table B.2: Floppy Drive Connector (FDD1)

Pin	Signal	Pin	Signal
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*

* low active

B.3 Parallel Port Connector (LPT1)

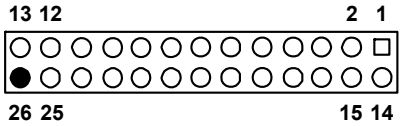


Table B.3: Parallel Port Connector (LPT1)

Pin	Signal	Pin	Signal
1	STROBE*	14	AUTOFD*
2	D0	15	ERR
3	D1	16	INIT*
4	D2	17	SLCTINI*
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C

* low active

B.4 VGA Connector (VGA1)

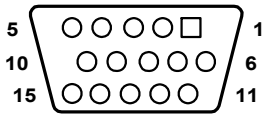


Table B.4: VGA Connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK

B.5 RS-232 Serial Port (COM1, COM2)

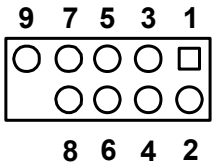


Table B.5: RS-232 Serial Port (COM1, COM2)	
Pin	**Signal**
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	N/A

B.6 PS/2 Keyboard/Mouse Connector (KBMS1)

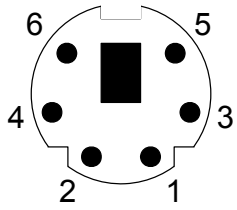


Table B.6: PS/2 Keyboard/Mouse Connector (KBMS1)	
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.7 External Keyboard Connector (KBMS2)

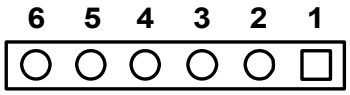


Table B.7: External Keyboard Connector (KBMS2)	
Pin	**Signal**
1	KBCLK
2	KBDAT
3	MSDAT
4	GND
5	MSVCC
6	MSCLK

B.8 CPU Fan Power Connector (CPUFAN1)

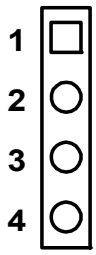


Table B.8: CPU Fan Power Connector (CPUFAN1)	
Pin	**Signal**
1	GND
2	+12 V
3	Detect
4	FANPWM

B.9 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

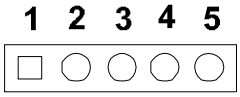


Table B.9: Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)	
Pin	**Signal**
1	LED power (+5 V)
2	NC
3	GND
4	KEYLOCK#
5	GND

B.10 External Speaker Connector (JFP2 / SPEAKER)

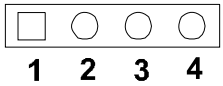


Table B.10: External Speaker Connector (JFP2 / SPEAKER)	
Pin	**Signal**
1	SPK+
2	NC
3	SPK_IN
4	SPK-

B.11 Reset Connector (JFP1 / RESET)

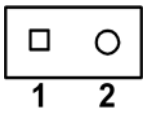


Table B.11: Reset Connector (JFP1 / RESET)	
Pin	**Signal**
1	RESET #
2	GND

B.12 HDD LED (JFP2 / HDDLED)

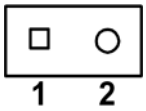


Table B.12: HDD LED (JFP2 / HDDLED)	
Pin	**Signal**
1	VCC
2	#HD_ACT

B.13 ATX Soft Power Switch (JFP1 / PWR_SW)

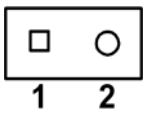


Table B.13: ATX Soft Power Switch (JFP1 / PWR_SW)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

B.14 HD Link connector (HDAUD1)

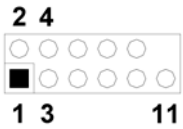


Table B.14: HD Link Connector (HDAUD1)			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	2	GND
3	Sync	4	BITCLK
5	SDOUT	6	SDIN0
7	SDIN1	8	AC-RST
9	+12V	10	GND
11	GND	12	N/C

B.15 LAN LED Connector (LAN LED1)

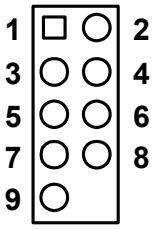


Table B.15: LAN LED Connector (LANLED1)

Pin	Signal
1	#LAN1_ACT
2	V33_AUX
3	#LAN1_LINK1000
4	#LAN1_LINK100
5	V33_AUX
6	#LAN2_ACT
7	V33_AUX
8	#LAN2_LINK1000
9	#LAN2_LINK100

B.16 AT Power Connector (ATXF1)

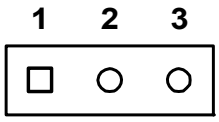


Table B.16: AT Power Connector (ATXF1)

Pin	Signal
1	#PSON
2	VCC
3	5VSB

B.17 System I/O Ports

Table B.17: System I/O Ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

B.18 DMA Channel Assignments

Table B.18: DMA Channel Assignments	
Channel	**Signal**
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

B.19 Interrupt Assignments

Table B.19: Interrupt Assignments		
Priority	**Interrupt#**	**Interrupt Source**
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Available
7	IRQ11	Available
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Parallel port 2
15	IRQ6	Diskette controller (FDC)
16	IRQ7	Parallel port 1 (print port)

B.20 1st MB Memory Map

Table B.20: 1st MB Memory Map	
Addr. range (Hex)	**Device**
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.21 PCI Bus Map

Table B.21: PCI Bus Map				
Signal	**IDSEL**	**INT# Pin**	**GNT**	**REQ**
PCI slot 1	AD31	INT D, A, B, C	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT B,C,D,A	GNT C	REQ C
PCI slot 4	AD28	INT A, B, C, D	GNT D	REQ D

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